LG

Service Manual

Model : KG195

LG

Internal Use Only

Service Manual

KG195

Date: September, 2007 / Issue 1.0

AMENDMENT RECORD

AMENDMENT RECORD SHEET

Issue Number	Date
Draft 1.00	20.07.2007

For details of previous history refer to archival documents.

New Issue Number - Date		Changes This Issue, Page and Description	Remarks
Draft 1.00	20.07.2007	All for Publication	First draft Issue

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SECTION 1

Introduction

1. Introduction

This is the Electronic Service Manual for KG195 Triple Band GSM Digital Cellular Telephone from LG.
It contains specific information on repair and test procedures.
For details of user functions, general operation and installation, please refer to the User Guide.

The Service Manual is set out in the following sections.

1. **Precautions for Repair Work:** provides general guidelines for undertaking safe and efficient repair work.

2. **Unit Specification:** provides the technical specifications for KG195 Triple Band GSM Digital Cellular Telephone.

3. **Introduction of Service Level:**

   a) Service Level 1: describes definition of Service Level 1, equipment and tools required for this level.
   b) Service Level 2: describes definition, equipment and tools required for Service Level 2.

4. **Circuit Description:** provides functional details of the circuits, block diagrams and component purpose descriptions.

5. **Servicing:** defines the jigs, fixtures and test configurations required for servicing the product; and describes the processes of assembly and disassembly.

6. **Troubleshooting:** provides an aid to fault finding the product. Includes, using the signal levels and plots at various parts of the circuit.

7. **Device Information:** provides functional information and pin-outs of most of the semiconductor devices within the HHP.

8. **Glossary:** terms used in this GSM and this manual.

SECTION 2

Precautions for Repair Work

2. Precautions for Repair Work

Important

Please read the following cautions, notes and warnings before progressing through this manual or undertaking any repair action.
Remember: **SAFETY FIRST!**

CAUTION:

AC Power Cord:
Care must be taken not to damage the AC power cord as fire or electric shock may result.

Battery Pack:
Only use the specified batteries and chargers with this equipment.
Do not short the battery terminals together.
Keep the battery pack away from fire and sources of ignition.
Remember to recharge the battery pack after each use.

Before Powering up the Equipment:
- Only switch on the telephone's power once the test or installation set-up is complete.
- Switching on at the wrong time may result in electric shock or damage to system components.
- Always ensure that the power is switched off before making connections / disconnection's.
- It is important to check that the correct DC voltage is applied to the equipment to prevent electrical damage.

Component Polarity:
Always check the polarity of connections and components before soldering.
Particular attention must be paid to IC.s, diodes, transistors, capacitors and any other semiconductor device that is polarity dependent.

Electrostatic Damage (ESD):
Semiconductor devices are easily damaged by electrostatic discharge. Many of the procedures detailed in this manual involve disassembly of the equipment and therefore handling of the printed circuit boards.
To protect these devices from ESD a wrist strap connected to ground must be worn.
In addition to this the work surface must be covered with an anti-electrostatic mat, which should also be grounded.
If printed circuit boards are to be stored without being re-assembled into their equipment, then they must be kept in an anti-electrostatic bag.

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Grounding:

Each piece of test equipment should be electrically grounded. A third (grounding) pin is provided as a safety feature. Ensure that the electrical outlet also contains this feature.

Cosmetic Protection during Repair Work:

Always ensure that the working surface is kept clean and free from abrasive materials.
The LCD is very susceptible to scratches and damage. It should be covered with clear adhesive vinyl while the equipment is disassembled.

Storage of Faulty Components:

Any components that are replaced due to failure should be kept safely in an antielectrostatic container. NEC's Quality or Research & Development Departments may require them to make quality and reliability investigations.

No Fault Found Equipment:

In some cases the reported symptom may not be apparent. You may subject the equipment to a controlled amount of stress, vibration and temperature variation to see if the fault occurs.
Care should be taken not to apply excessive stress or vibration or extreme temperature variations as further faults may develop.

Soldering and Disordering:

The solder used is only Pb-free.
Fast, accurate and high quality soldering is required to minimise the risk of heat damage to the electronic components. It is necessary to adjust the temperature of soldering tip to 330 degrees or less. The soldering tip should not be in contact with components or PCB tracks for longer than 4 seconds (average). This time depends on temperature conditions of parts.
Heat the pad on the PCB and the lead, quickly apply solder, remove heat and cool. After soldering is complete, ensure that all solder joints are of good quality - no dry joints, solder bridges, cracks or excess solder. The majority of chip components are machine mounted using solder paste. Removal of the solder is not sufficient for chip component removal. Each solder point must be heated simultaneously and quickly (to prevent component and PCB damage). When the solder has melted, remove the component with tweezers.

2. Precautions for Repair Work

Short Circuits:
Care must be taken to avoid short circuits. Soldering, solder dust, screws, metal clippings, metal wrist watches etc. can cause short circuits on PCBs which may result in component damage.

Test Equipment Calibration:
Your test equipment should be calibrated before use. Frequent calibration is essential to ensure high quality and reliable repairs.

Cleaning:
Before cleaning ensure that the telephone is switched off and disconnected from the power source. Cleaning should be done using a soft dry cloth. If the equipment is heavily soiled a soft cloth soaked in a mild synthetic detergent diluted in water may be used.
Never use benzene or any other chemicals to clean the equipment.

RF Shielding:
It is advisable to carry out detailed measurements and repair (in particular RX) in a shielded area to minimise RF interference.

AC Adapter and Battery Charger:
The AC adapter and battery chargers are for indoor use only. Ensure that the devices are not exposed to rain or moisture.

Electrical Safety:
Electrical equipment is hazardous if misused. Any repairs must be carried out with care and only by authorised personnel.
Ensure all power sources are switched off and power cords removed before undertaking any repairs.

Hazardous Waste:
The battery pack, if incorrectly disposed of, is an environmental hazard. It must be disposed of in accordance with the regulations of the country concerned. Never dispose of the battery pack in fire or water.

Confidentiality:
The circuitry within this equipment contains several components that are regarded as company confidential. Only use NEC specified parts as replacements.

RF Injury:
To avoid RF injury, direct exposure to radio frequency energy should be avoided. In particular, exposed parts of your body (especially the eyes and face) should not come into contact with the antenna while the equipment is transmitting.

Storage Conditions:

It is recommended that the following storage conditions should be avoided to prevent damage to the equipment: -

Dusty.
Humid.
Near to magnetic equipment
In direct sunlight

Ventilation:

Repair areas should be well ventilated and fume extraction systems should be installed where necessary. Potential hazardous substances are solder fumes, flux, alcohol etc.

PCB Handling:

It is recommend that cotton gloves are worn during repair work. This is to protect your hands from chemical contamination and to protect the PCBs from fingerprints and humidity.

SIM Card:

- Do not bend.
- Clean by using a soft dry cloth.

AUDIO Parts:

- Be careful for alien substance/oils and fats, etc. not to adhere to the terminal contact part of MIC, the receiver, the speaker.
- Be careful to handle AUDIO parts with electrostatics measures at the worker/in the working place.
- Be careful not to spend a stress on the MIC side part to the utmost.
- Be careful not to pressurize the coil joint (protection Bond part) of the receiver and speaker because they are easy of broken.
- Be careful for alien substance to approach to sound hole part of the speaker.
- Be careful sufficiently so as not to blow air with the process into the receiver, speaker/MIC sound hole. It causes sounds being small by the diaphragm transformation or vibration.

SECTION 3

Unit Specifications

3. UNIT SPECIFICATION

PRODUCT FEATURES AND SPECIFICATION

Solution	MT6226	Media Tek
Type	Bar type	
Antenna Type	Internal (tri-Band)	
Main Display	1.77”, 128x160	
GPRS	Class 10	
MMS	Yes, 1.1	
Camera	0.3M (OV7670)	
Battery	750mAh	BYD cell
Audio player	Yes (support MP3 and AAC playback)	
FM Receiver	Yes, US/Europe band(87.5~108MHz)	
MPEG4/H.263	Yes (support 3GP)	
H.264	No(no support)	
AAC+	No	
FM as alarm	Yes	
Scheduled FM recording	Yes	
MP4 for incoming call/ power on off animation and screen saver	Yes	
Loud Speaker	Yes	
Audio player--real resuming	Yes, for MP3 only	
Video recording	Yes	
Memory Size	128Mb NOR Flash + 32Mb PSRAM + 512Mb NAND	
Internal NAND	512Mb NAND	
Memory Card	T-flash	
Bluetooth	Yes, version 1.2	
USB	Yes, slave 1.1	
IrMC	No	
WAP	Yes, 2.0	

Java	Yes	
PoC	No	
EMAIL	No	
Status LED	Yes	
DRM	No	
Dictionary	No	
MPEG4 caller ID	Yes	
Finger handwriting	No	
Touch Panel	No	
Caption	No	
OTA	Yes	
AB repeat	No	
Music Equalizer	Yes	
Image Editing	No	
In flight mode	Yes	

Category	Requirement Description	Parameter	Support
Frequency	Shall support multiple radio bands/power		
	- 850 MHz/class 4 (2W)		N
	- 900 MHz/class 4 (2W)		Y
	- 1800 MHz/class 1 (1W)		Y
	- 1900 MHz/class 1 (1W)		Y
Antenna	Shall support [Internal/External] antenna	Internal	Y
GPRS	Shall support GPRS bearer		
	- release [R#]	R98	Y
	- multi-slot class [class #]	10	Y
	- Service class [Class #]	Class B	Y
	- Coding scheme [CSn]	CS1,CS2, CS3, CS4	Y
Data Service	Shall support following data transaction mode and services.		
	- Fax		N
	- Data		N
	- WAP [rel #]	2.0	Y
	- SMS		Y
	- EMS [rel #]	Code 5.0	Y
	- MMS [rel #]	1.1	Y
Java	Support JAVA MIDP [ver #]	2.0	Y
	Support JAVA CLDC [ver #]	1.0	Y
Voice codec Audio decoder	Shall support multiple voice codec		Y
	- FR		Y
	- EFR		Y
	- HR		Y
	- AMR NB (air link)		N
	Shall support multiple audio decoders		
	- MP3		Y
	- AAC		Y
	- AAC+		N
Physical	The physical dimension is [Length x Width x Thickness mm]	103.5*46.3*12.4mm	Y
	The overall volume is [# cc]	59	Y
	The weight is [# g]	TBC	Y

3. UNIT SPECIFICATION

Category	Requirement Description	Parameter	Support
Display	Shall support main display with following characteristics:		Y
	- Size	1.77”	Y
	- Type	TFT, Transmissive	Y
	- Color depth	262K	Y
	- Pixel resolution [width x height]	128x160	Y
	- Active area [W x H mm]	28.032(W)x 35.04(H) mm	Y
Camera	Shall support high resolution camera with following characteristics:		Y
	- Active pixel array up to resolution [X x Y pixels]	640x480	Y
	- Sensor type [CMOS or CCD]	CMOS	Y
FM radio	Shall support FM radio bands		
	- US/Europe band	87.5~108MHz	Y
	- Japan band	76~90MHz	N
Battery	Shall support Li-Ion battery with minimum capacity of [mAh].	750mAh	Y
Connectivity	Shall support following device to connect external devices.		
	- USB [ver, host or slave or OTG]	1.1, slave	Y
	- Bluetooth [ver, power class]	1.2, class 2	Y
	- Bluetooth profiles	GAP SDAP DUN SPP HSP HFP OPP FTP A2DP	Y
Storage	Shall support mass data storage for different multimedia content.		Y
	- Build-in NAND [MB]. Used as mobile disk. (Notes : Designed footprint shall be possible to support multiple memory capacity)		Y
	- Micro SD		Y

Category	Requirement Description	Parameter	Support
Indication	Shall support LED for status indication.	1 Yellow Green LED	Y
	Shall support LED for charger-in status indication.	1 Orange LED	Y
Vibrator	Shall support in built vibration alert		Y
SIM Card	Shall support SIM card both 1.8V and 3V.		Y
Keypad	Shall support - 12 alphanumeric/number keys (0-9,#,*) - 4 function keys (on hook, off hook, left softkey, right softkey) - 4 way navigation keys (up, down, left, right) - 3 side keys(one on the right and two on the left)		Y
	Shall support illumination color [color] for keypad backlight.	10 LED Blue	Y
	Shall design in a nub on or around key number 5.		Y
Camera	Shall support AWB (Automatic White Balance)		Y
	Shall support automatic flicker reduction		N
	Shall support gamma correction		Y

* Battery life is Network dependent; variations may occur.
The KG195 HHP works closely with the network and the standby and talk times achieved depend upon this. In particular the location of the HHP within the network, the type of SIM, reception of area messages, the use of AMR, Full Rate speech, Half Rate speech or Enhanced Full Rate speech and other factors will affect both standby and talk times.

3. UNIT SPECIFICATION

Transmitting Frequency Range:	EGSM : 880 - 915MHz DCS1800 : 1710 - 1785MHz PCS1900 : 1850 - 1910MHz
Receiving Frequency Range:	EGSM : 925 - 960MHz DCS1800 : 1805 - 1880MHz PCS1900 : 1930 - 1990MHz
TX - RX Duplex Spacing:	EGSM : 45MHz DCS1800 : 95MHz PCS1900 : 80MHz
Channel Spacing:	EGSM : 200KHz DCS1800 : 200KHz PCS1900 : 200KHz
Number of Channels (ARFCN):	GSM : 124 (Numbered 1 to 124) std. EGSM : 50 (Numbered 975 to 1023 & 0) DCS1800 : 374 (Numbered 512 to 885) PCS1900 : 299 (Numbered 512 to 810)
Power Class:	EGSM : Class 4 MTS (33 +/- 2dBm) DCS1800 : Class 1 MTS (30 +/- 2dBm) PCS1900 : Class 1 MTS (30 +/- 2dBm)
Tx Peak Current:	2500mA
GPRS Class:	Class 10; Operation class B
GPRS Coding Scheme:	CS1/CS2/CS3/CS4
Data Rates (Packet):	EGSM/DCS1800/PCS1900 : Uplink : Up to 21.4Kbps (1 slot) Downlink : Up to 85.6Kbps (4 slots)
Data Rates (Circuit Switch):	EGSM/DCS1800/PCS1900 : Up to 9600Kbps

TRANSMITTER (EGSM)

RF Power Output

Power Levels	15 decrements in 2dB steps
Power Control Level 5	33dBm +/-2dB
Power Control Level 6	31dBm +/-3dB
Power Control Level 7	29dBm +/-3dB
Power Control Level 8	27dBm +/-3dB
Power Control Level 9	25dBm +/-3dB
Power Control Level 10	23dBm +/-3dB
Power Control Level 11	21dBm +/-3dB
Power Control Level 12	19dBm +/-3dB
Power Control Level 13	17dBm +/-3dB
Power Control Level 14	15dBm +/-3dB
Power Control Level 15	13dBm +/-3dB
Power Control Level 16	11dBm +/-5dB
Power Control Level 17	9dBm +/-5dB
Power Control Level 18	7dBm +/-5dB
Power Control Level 19	5dBm +/-5dB

TX Frequency Output

Low Channel (Ch 975)	880.2 MHz
Mid Channel (Ch 62)	902.4 MHz
High Channel (Ch 124)	914.8 MHz
TX Frequency Calculation (F_{tx})MHz (0 - 124) (975 - 1023)	890 + (ARFCN x 0.2)MHz 890 + 0.2x(ARFCN - 1024)MHz

Phase and Frequency Error

Peak Phase Error	< 20 degrees
RMS Phase Error	< 5 degrees
Frequency Stability	< +/- 90Hz

3. UNIT SPECIFICATION

TRANSMITTER (DCS1800)

RF Power Output

Power Levels	16 decrements in 2dB steps
Power Control Level 0	30dBm +/-2dB
Power Control Level 1	28dBm +/-3dB
Power Control Level 2	26dBm +/-3dB
Power Control Level 3	24dBm +/-3dB
Power Control Level 4	22dBm +/-3dB
Power Control Level 5	20dBm +/-3dB
Power Control Level 6	18dBm +/-3dB
Power Control Level 7	16dBm +/-3dB
Power Control Level 8	14dBm +/-3dB
Power Control Level 9	12dBm +/-4dB
Power Control Level 10	10dBm +/-4dB
Power Control Level 11	8dBm +/-4dB
Power Control Level 12	6dBm +/-4dB
Power Control Level 13	4dBm +/-4dB
Power Control Level 14	2dBm +/-5dB
Power Control Level 15	0dBm +/-5dB

TX Frequency Output

Low Channel (Ch 512)	1710.2 MHz
Mid Channel (Ch 699)	1747.6 MHz
High Channel (Ch 885)	1784.8 MHz
TX Frequency Calculation (F_{tx})MHz	1710.2 + 0.2 x (ARFCN - 512) = F_{tx} MHz

Phase and Frequency Error

Peak Phase Error	< 20 degrees
RMS Phase Error	< 5 degrees
Frequency Stability	< +/- 180Hz

TRANSMITTER (PCS1900)

RF Power Output

Power Levels	16 decrements in 2dB steps
Power Control Level 0	30dBm +/-2dB
Power Control Level 1	28dBm +/-3dB
Power Control Level 2	26dBm +/-3dB
Power Control Level 3	24dBm +/-3dB
Power Control Level 4	22dBm +/-3dB
Power Control Level 5	20dBm +/-3dB
Power Control Level 6	18dBm +/-3dB
Power Control Level 7	16dBm +/-3dB
Power Control Level 8	14dBm +/-3dB
Power Control Level 9	12dBm +/-4dB
Power Control Level 10	10dBm +/-4dB
Power Control Level 11	8dBm +/-4dB
Power Control Level 12	6dBm +/-4dB
Power Control Level 13	4dBm +/-4dB
Power Control Level 14	2dBm +/-5dB
Power Control Level 15	0dBm +/-5dB

TX Frequency Output

Low Channel (Ch 512)	1850.2MHz
Mid Channel (Ch 657)	1879.2MHz
High Channel (Ch 810)	1909.8MHz
TX Frequency Calculation (F_{tx})MHz	1850.2 + 0.2 x (ARFCN - 512) = F_{tx} MHz

Phase and Frequency Error

Peak Phase Error	< 20 degrees
RMS Phase Error	< 5 degrees
Frequency Stability	< +/- 185Hz

3. UNIT SPECIFICATION

RECEIVER (EGSM)

RX Frequency Input

Low Channel (Ch 975)	925.2 MHz
Mid Channel (Ch 62)	947.4 MHz
High Channel (Ch 124)	959.8 MHz
RX Frequency Calculation (F_{rx})MHz (0 - 124) (975 - 1023)	 Ftx + 45 Mhz = F_{rx} MHz Ftx + 45 Mhz = F_{rx} MHz

BER (Bit Error Ratio)	Type II BER <2.4% at -102dBm Type II BER <0.1% at -15dBm

RECEIVER (DCS1800)

RX Frequency Input

Low Channel (Ch 512)	1805.2 MHz
Mid Channel (Ch 699)	1842.6 MHz
High Channel (Ch 885)	1879.8 MHz
RX Frequency Calculation (F_{rx})	F_{tx} + 95 Mhz = F_{rx} MHz

BER (Bit Error Ratio)	Type II BER <2.4% at -102dBm Type II BER <0.1% at -23dBm

RECEIVER (PCS1900)

RX Frequency Input

Low Channel (Ch 512)	1930.2MHz
Mid Channel (Ch 657)	1959.2MHz
High Channel (Ch 810)	1989.8 MHz
RX Frequency Calculation (F_{rx})	F_{tx} + 80 Mhz = F_{rx} MHz

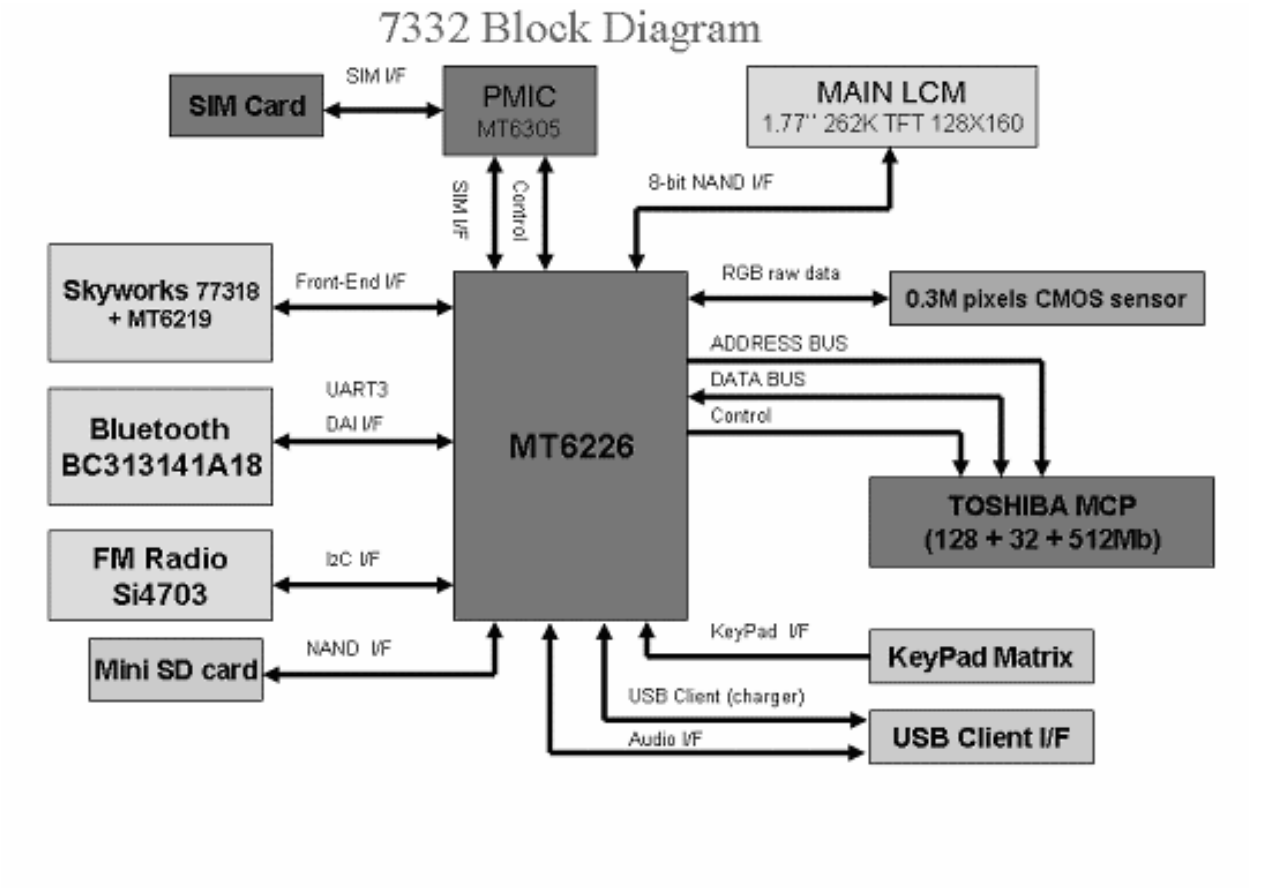
BER (Bit Error Ratio)	Type II BER <2.4% at -102dBm Type II BER <0.1% at -23dBm

SECTION 4

Circuit Description

4. Circuit Description

4.1 LOGIC BLOCK DIAGRAM



4.2 LOGIC

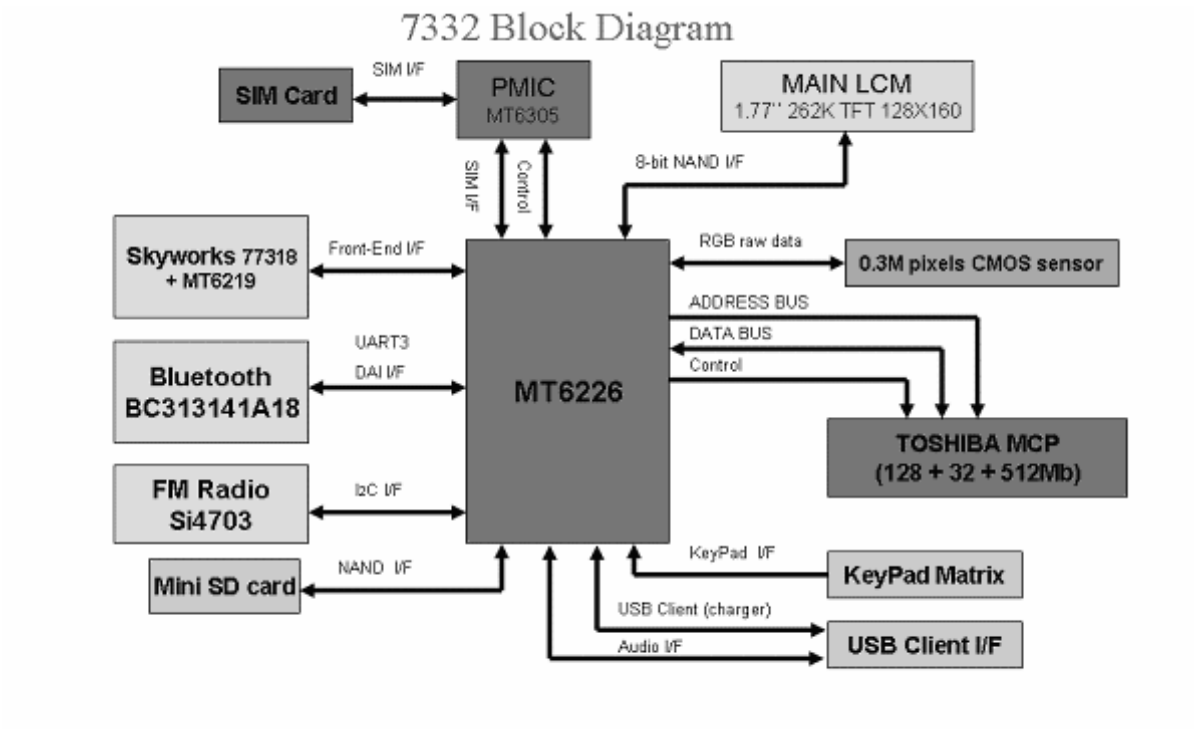
LOGIC AND BASE BAND PORTION

4.2.1 INTRODUCTION

The logic part of 7332 phone is based on Leonardo that is MTK Systems platform.
The circuit comprises the following main functional blocks:

- Memory Subsystem
- Baseband CPU(MTK6226): Baseband Controller, 52MHz 32bit RISC ARM7EJ-STM
- MT6305: PMIC handles all baseband power
- FM Radio IC(SI4703)
- Main LCM (262K TFT)
- Camera (0.3M plxels CMOS sensor)
- Bluetooth(BC313141A18)
- TOSHIBA MCP(128+32+512MB)
- User I/O (KEY,MINI SD CARD,USB Client,SIM card)

4.2.2 SYSTEM BLOCK DIAGRAM



4.2.3 MEMORY SUBSYSTEM

KG195 handset memory;
Memory: (NOR128MB+PSRAM32MB+NAND512MB)
Its detail is as follows.

The consists of 128M-bit NOR Type Flash memory, 32M-bit PSRAM, NAND512MB in a 107-ball FBGA

4.2.3.1 Memory

Type and capacity of memories, used for 311-0000-00015 are as follows:

Description	Manufacturer	Type of memory	Capacity
311-0000-00015	TOSHIBA	Flash Memory (NOR)	128Mb
		Flash Memory (NAND)	512Mb
		PSRAM	32Mb

311-0000-00015 is the Stacked Memory comprising of the above four memories.

4.2.3.2 Memory Interface Description

MT6226 incorporates a powerful and flexible memory controller, External Memory Interface, to connect with a variety of memory components. This controller provides one generic access scheme for FLASH Memory, SRAM and PSRAM. Up to 8 memory banks can be supported simultaneously, BANK0 - BANK7, with a maximum size of 64MB each. Since most of the FLASH Memory, SRAM and PSRAM have similar AC requirements, a generic configuration scheme to interface them is desired.
This way, the software program can treat different components by simply specifying certain predefined parameters. All these parameters are based on cycle time of system clock.
The interface definition based on such scheme is listed in following table. Note that, this interface always operates data in Little Endian format for all types of accesses.

Signal Name	Type	Description
EA[25:0]	O	Address Bus
ED[15:0]	I/O	Data Bus
EWR#	O	Write Enable Strobe
ERD#	O	Read Enable Strobe
ELB#	O	Lower Byte Strobe
EUB#	O	Upper Byte Strobe
ECS# [7:0]	O	BANK0~BANK7 Selection Signal
EPDN	O	PSRAM Power Down Control Signal
ECLK	O	Burst Mode FLASH Memory Clock Signal
EADV#	O	Burst Mode FLASH Memory Address Latch Signal
EWAIT	I	Wait Signal Input

4.2.4 MTK6226 BASE BAND CHIP

Details the block diagram of MT6226. Based on a dual-processor architecture, MT6226 integrates both an ARM7EJ-S core and a digital signal processor core. ARM7EJ-S is the main processor that is responsible for running high-level GSM/GPRS protocol software as well as multi-media applications.

The digital signal processor handles the low-level MODEM as well as advanced audio functions. Except for some mixed-signal circuitries, the other building blocks in MT6226 are connected to either the microcontroller or the digital signal processor.

Specifically, MT6226 consists of the following subsystems:

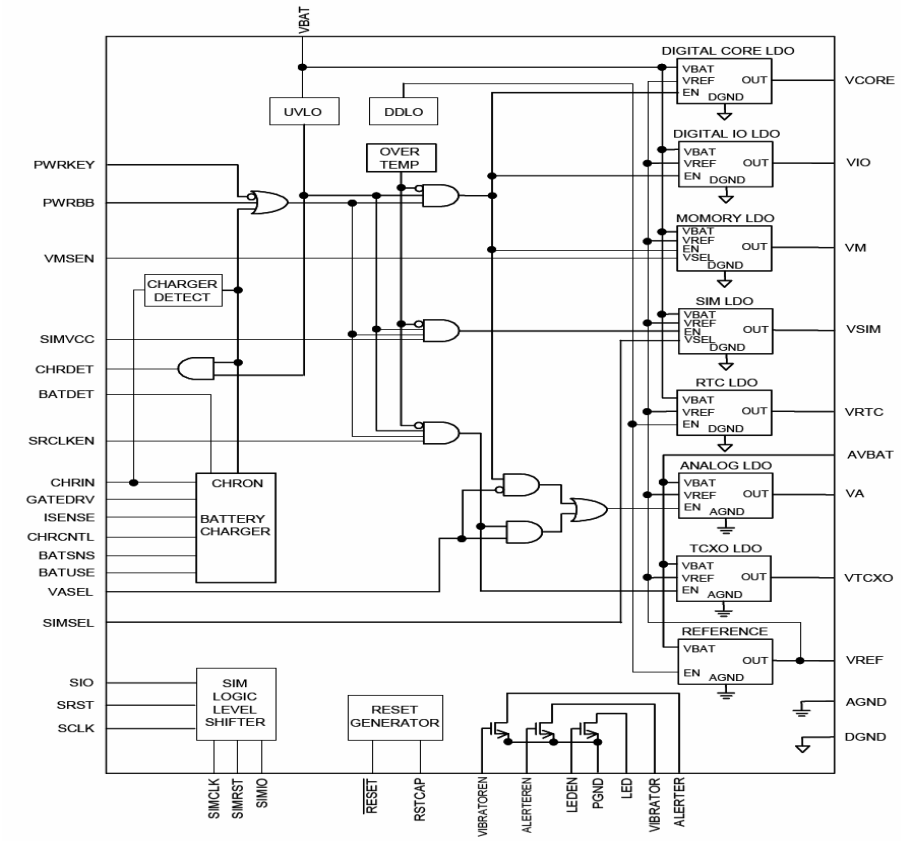
1. Microcontroller Unit (MCU) Subsystem - includes an ARM7EJ-S RISC processor and its accompanying memory management and interrupt handling logics.
2. Digital Signal Processor (DSP) Subsystem - includes a DSP and its accompanying memory, memory controller, and interrupt controller.
3. MCU/DSP Interface - where the MCU and the DSP exchange hardware and software information.
4. Microcontroller Peripherals - includes all user interface modules and RF control interface modules.
5. Microcontroller Coprocessors - runs computing-intensive processes in place of Microcontroller.
6. DSP Peripherals - hardware accelerators for GSM/GPRS channel codec.
7. Multi-media Subsystem - integrates several advanced accelerators to support multi-media applications.
8. Voice Front End - the data path for converting analog speech from and to digital speech.
9. Audio Front End - the data path for converting tereo audio from stereo audio source
10. Baseband Front End - the data path for converting digital signal from and to a nalog signal of RF modules.
11. Timing Generator - generates the control signals related to the TDMA frame timing.
12. Power, Reset and Clock subsystem - manages the power, reset, and clock distribution inside MT6226. Details of the individual subsystems and blocks are described in following Chapters.

4.2.5 PMU IC MT 6305

The MT6305 is a power management system chip optimized for GSM handsets, especially those based on the Media Tek MT620x system solution. It contains seven Low Drop Out Regulators (LDO), one to power each of the critical GSM sub-blocks. Sophisticated controls are available for power-up during battery charging, keypad interface, and RTC alarm. The MT6305 is optimized for maximum battery life, featuring a ground current of only 107μ A and 187μ A when the phone is in standby and operation respe ctively.

Phone State	CHRON	-UVLO	PWRBB(-PWRKEY)	SRCLKEN	Vrtc	Vd, Vio, Vm	Va, Vtcxo
No Battery or Vbat <2.5V	X	L	X	X	Off	Off	Off
2.5V < Vbat < 3.2V	L	L	X	X	On	Off	Off
Pre-Charging	H	L	X	X	On	Off	Off
Charger-on	H	H	X	X	On	Off	Off
Switched off	L	H	X	X	On	Off	Off
Stand-by	L	H	H	X	On	On	Off
Active	L	H	H	H	On	On	On

4. Circuit Description



PMU IC data sheet

PIN	NAME	FUNCTION
1	CHRIN	Charger Input Voltage
2	GATEDRV	Gate Drive Output
3,29	NC	
4	ISENSE	Charger Current Sense Input
5	CHRCNTL	Microprocessor Control Input Signal for Gate Drive, Internal Pull Low to DGND
6	CHRDET	Charger Detect Output
7	BATSNS	Battery Input Voltage Sense
8	VSIM	SIM Supply
9	SIMIO	Non-Level-Shifted Bidirectional Data I/O
10	SIMRST	Non-Level-Shifted S ll High to VIO IM Reset Input, Internal Pu

11	SIMCLK	Non-Level-Shifted SIM Clock Input
12	SIMVCC	SIM Enable
13	SIMSEL	High for Vsim=3.0V, Low for Vsim=1.8V
14	SIO	Level-Shifted SIM Bidirectional Data Input/Output
15	SRST	Level-Shifted SIM Reset Output
16	SCLK	Level-Shifted SIM Clock Output
17,21,46	DGND	Digital Ground
18	VM	Memory Supply
19	VBAT	Battery Input Voltage
20	VIO	Digital IO Supply
22	VRTC	Real Time Clock Supply
23	RSTCAP	Reset Delay Time Capacitance
24	/RESET	System Reset, Low Active
25	VTCXO	TCXO Supply
26	AVBAT	Battery Input Voltage for Analog Block Circuits
27	VA	Analog Supply
28	AGND	Analog Ground
30	VREF	Reference Voltage Output
31	SRCLKEN	VTCXO and VA Enable
32	PWRKEY	Power on/off Key, Internal Pull High to VBAT
33	PWRBB	Power on/off Signal from Microprocessor
34	VIBRATOREN	Vibrator Driver Enable, Internal Pull Low to DGND
35	ALERTEREN	Alerter Driver Enable, Internal Pull Low to DGND
36	LEDEN LED	Driver Enable, Internal Pull Low to DGND
37,40	PGND	Power Ground
38	VIBRATOR	Vibrator Driver Input
39	ALERTER	Alerter Driver Input
41	LED	LED Driver Input
42	BATUSE	Battery Type Selection, High for NiMH, Low for Li-ion, Internal Pull Low to DGND
43	BATDET	Battery Detect Input, Low for Battery Connected, Internal Pull High for Battery Disconnected
44 V	ASEL	High for VA enabled with VTCXO, Low for VA enabled with VD, Internal Pull Low to DGND
45	VMSEL	High for Vm=2.8 V, Low for Vm=1.8V, Internal Pull High to VIO
47	VBAT	Battery Input Voltage
48	VCORE	Digital Core Supply

4.2.5.1 Voice Band Interface

The audio front-end essentially consists of voice and audio data paths. Figure 1 shows the block diagram of the audio front-end. The entire voice band data paths comply with the GSM 03.50 specification. In addition, Mono hands-free audio or external FM radio playback path are provided. The audio stereo audio path facilitates audio quality playback, external FM radio, and voice playback through headset.

Figure 2 shows the digital circuits block diagram of the audio front-end. The APB register block is an APB peripheral that stores settings from the MCU. The DSP audio port block interfaces with the DSP for control and data communications.

The digital filter block performs filter operations for voice band and audio band signal processing. The Digital Audio Interface (DAI) block communicates with the System Simulator for FTA or external Bluetooth modules.

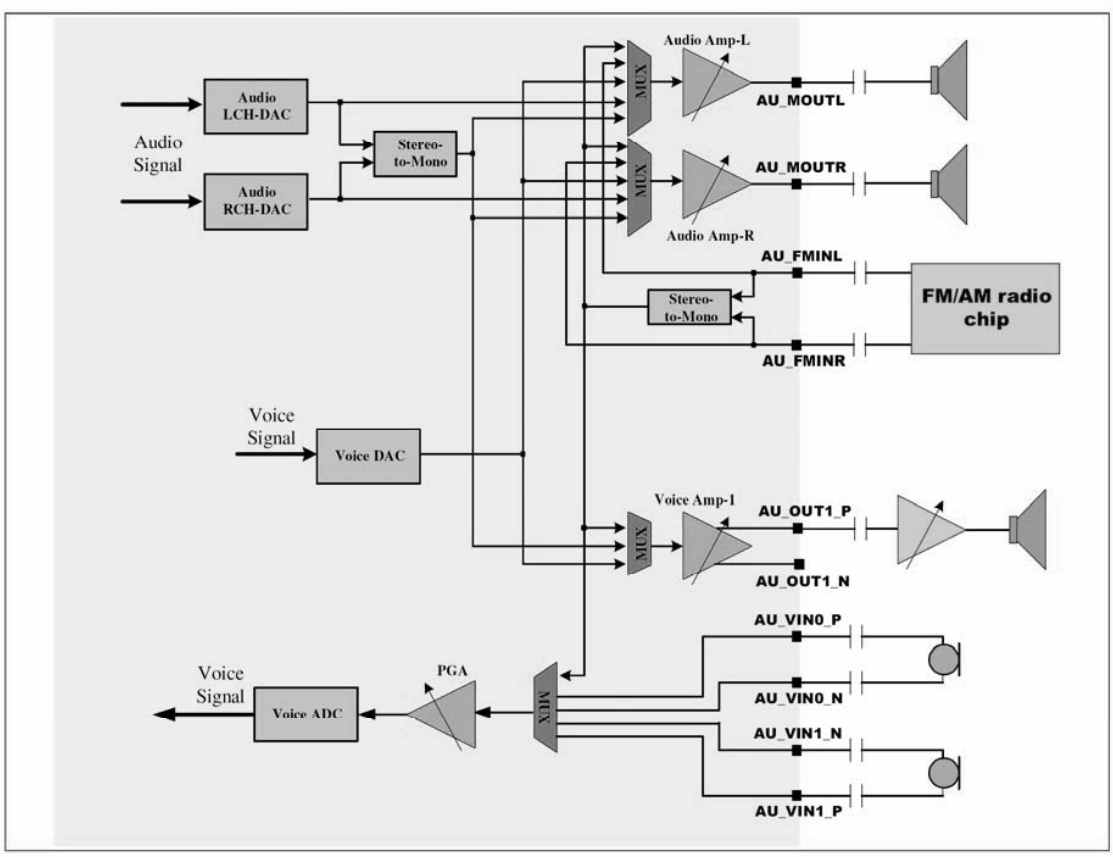
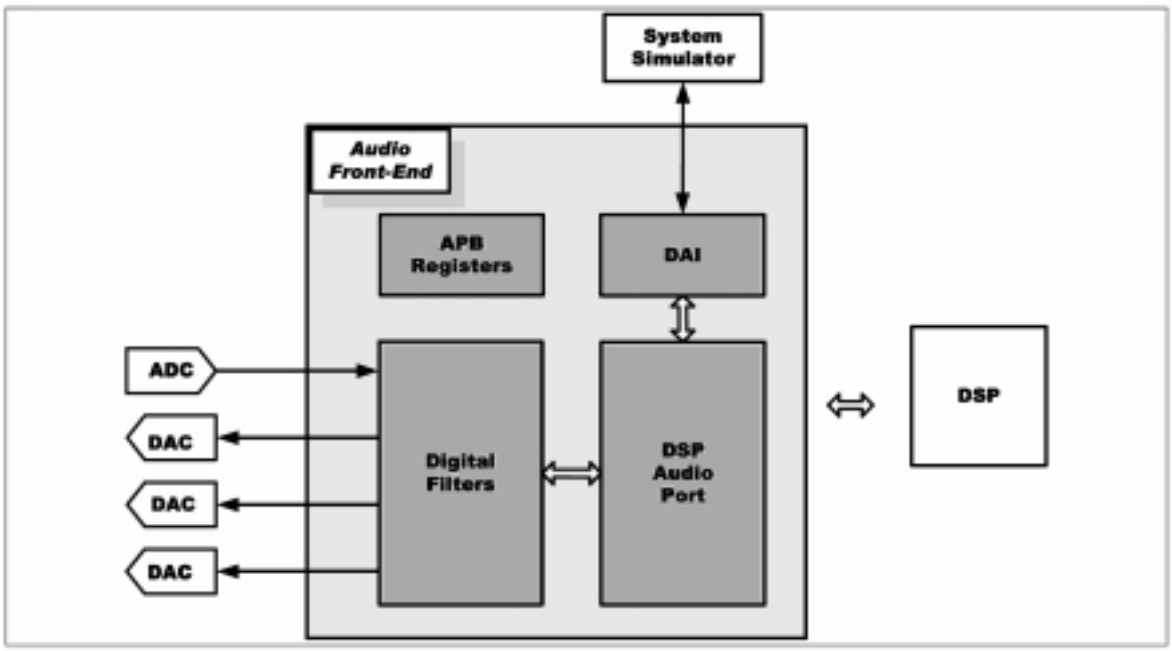


Figure 1 Block diagram of audio front-end

2. Figure 2 Block Diagram of Digital Circuits of the Audio Front-End



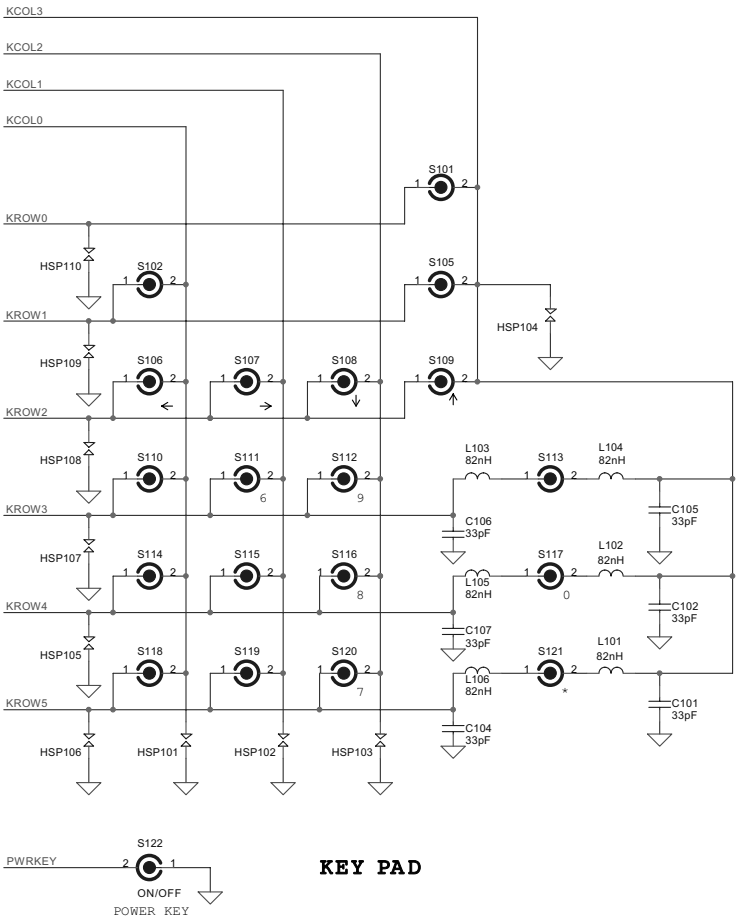
4.2.5.2 Monitor ADC

The following is 7332 ADC in use.

External ADC name	Purpose in 7332
ADC0_1-	Detect Battery Voltage and Current
ADC0_1+	Detect Battery Voltage and Current
ADC2_TBAT	Detect Battery temputer
ADC3_VCHG	Detect Charging voltage
ADC5_USB	Detect USB device
ADC6_ASS_ID	Detect handfree

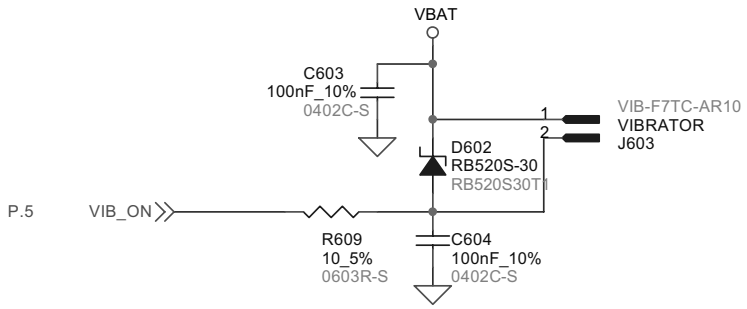
4.2.6 KEY SWITCHES

Circuit Diagram



4.2.7 VIBRATOR

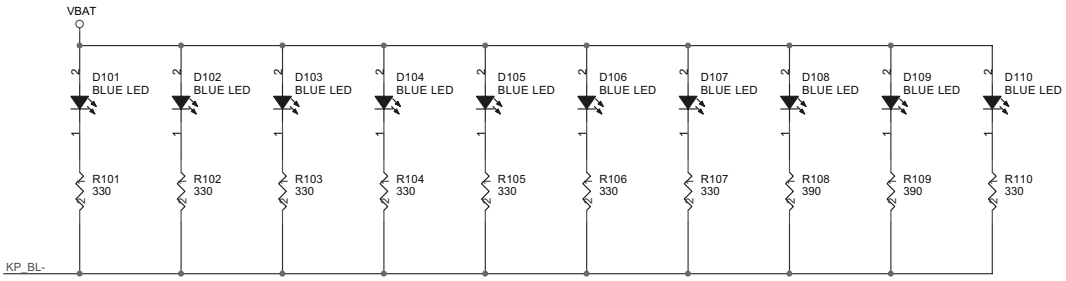
Circuit Diagram



4.2.8 KEY BACKLIGHT LED

There are eight LEDs used for key backlighting The LED driver of 6305 controls these LEDs.

CircuitDiagram



LED

4.2.9 BATTERY CHARGING

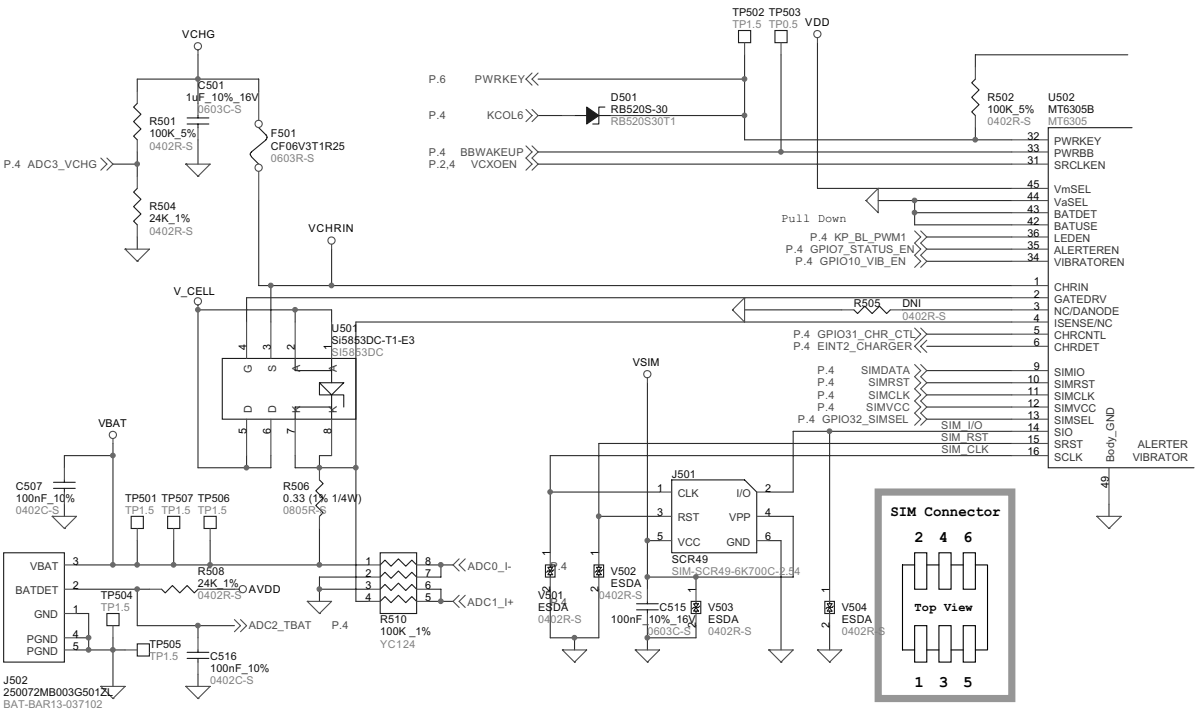
Battery management, which controls charge and discharge of the battery is the most important function for safety. 7332 SW performs charging algorithm. To regulator the power PMOS for set the charging current.

KG195 CHARGING CIRCUIT AND ALGORITHM

charging Circuit and Algorithm

7332 Charging circuit:

The schematic below shows the external charging components used in the Arima 7332 project. All ports are directly connected to the corresponding pins of PMU IC (6305). VCHG is the V charger supply rail coming directly from the wall-plug constant voltage charger via the system connector, and VBAT is the Battery Voltage rail, connected directly to the battery pack terminal connector. The system uses a solid ground plane, and both the Battery Pack terminal and the wall-plug charger return paths are connected directly to ground.

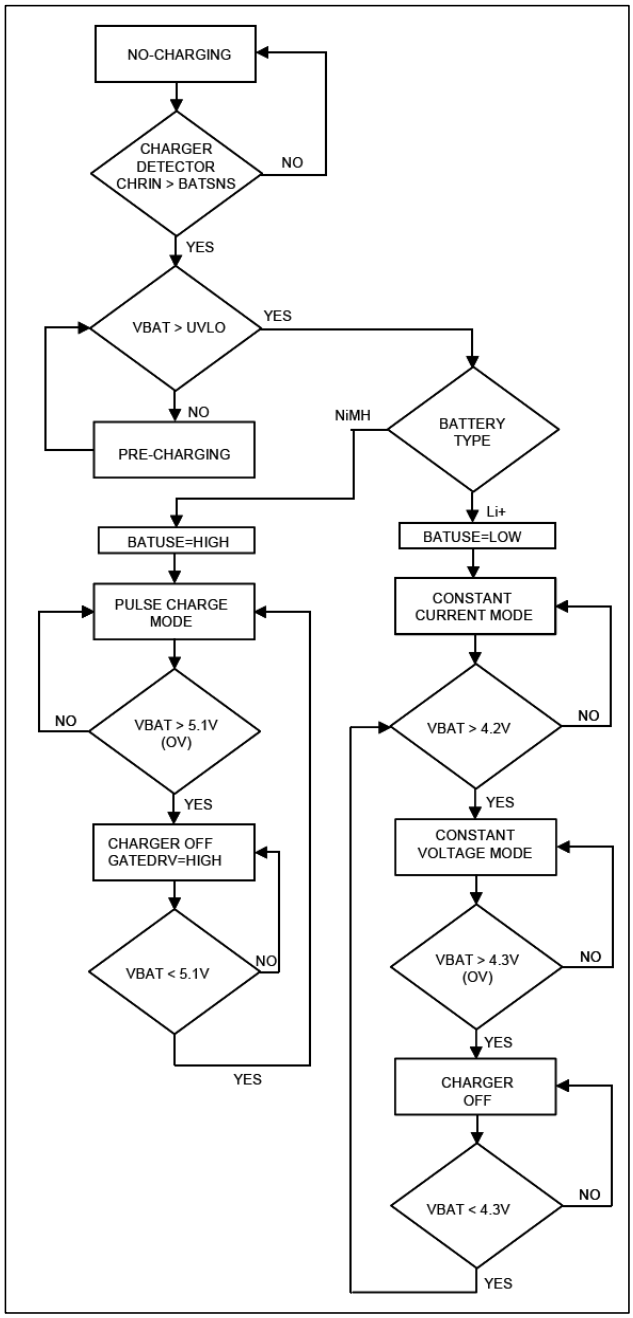


Charger Sub-system

The MT6305 battery charger can be used with Li-ion and NiMH batteries. BATUSE pin can set MT6305 to fit the battery type.

When BATUSE is set low, Li-ion battery is used. When BATUSE is set high, then NiMH battery is used. MT6305 charges the battery in three phases: pre-charging, constant current mode charging, and constant voltage mode charging. Figure 2 shows the flow chart of charger behavior. The circuitry of MT6305 combines with a PMOS transistor, diode and current-sense resistor externally to form a simple and low cost linear charger shown in Figure 3.

MT6305 is available pulsed top-off charging algorithm by the CHRCNTL pin control from baseband chipset.



Charge Detection

The MT6305 charger block has a detection circuit that determinates if an adapter has been applied to the CHRIN pin. If the adapter voltage exceeds the battery voltage by 3.75%, the CHRDET output will go high. If the adapter is then removed and the voltage at the CHRIN pin drops to only 2.5% above the VBAT pin, CHRDET goes low.

Pre-Charging mode

When the battery voltage is below the UVLO threshold, the charge current is in the pre-charging mode. There are two steps in this mode. While the battery voltage is deeply discharged below 2V, a 10mA trickle current of MT6305 charges the battery internally. When the battery voltage exceeds 2V, the pre-charge current is enabled, which allows 10mV (typically) across the external current sense resistor. This pre-charge current can be calculated:

Constant Current Charging Mode

Once the battery voltage has exceeded the UVLO threshold the charger will switch to the constant current charging mode. The MT6305 allows 160mV (typically) across the external current sense resistor. This constant current can be calculated.

$$I_{PRE\_CHARGING} = \frac{V_{SENSE}}{R1} = \frac{10mV}{R1}$$

If the voltage of Li-ion battery is below 4.2V (5.1V for NiMH battery), the battery will be in the constant current charging mode.

$$I_{CONSTANT} = \frac{V_{SENSE}}{R1} = \frac{160mV}{R1}$$

Constant Voltage Charging Mode

This mode is only applied to Li-ion battery charging. If the battery has reached the final charge voltage, a constant voltage is applied to the battery and keeps it at 4.2V. The charge termination is determined by the baseband chip internally, which will pull the CHRCNTL low to stop the charger. Once the battery voltage exceeds 4.3V of Li-ion battery (5.1V of NiMH battery), a hardware over voltage protection (OV) should be activated and turn off the charger block of MT6305.

Pulsed Charging Algorithm

MT6305 is available to pulsed top-off charging algorithm by the CHRCNTL pin. The control signal is from baseband chipset to limit the charging duty cycle. This charging algorithm combines the efficiency of switch-mode chargers with the simplicity and low cost of linear chargers.

Battery Voltage Monitor

As the Table 2 shown, the relations of battery voltage and charger control signals are listed. When Vbat < 3.2V, an UVLO signal is active low. When Vbat >= 4.3, an OV signal is active and terminates charging. The disconnection of battery could be detected by BATDET pin. BATDET is pulled high internally when battery disconnected and terminates charging immediately.

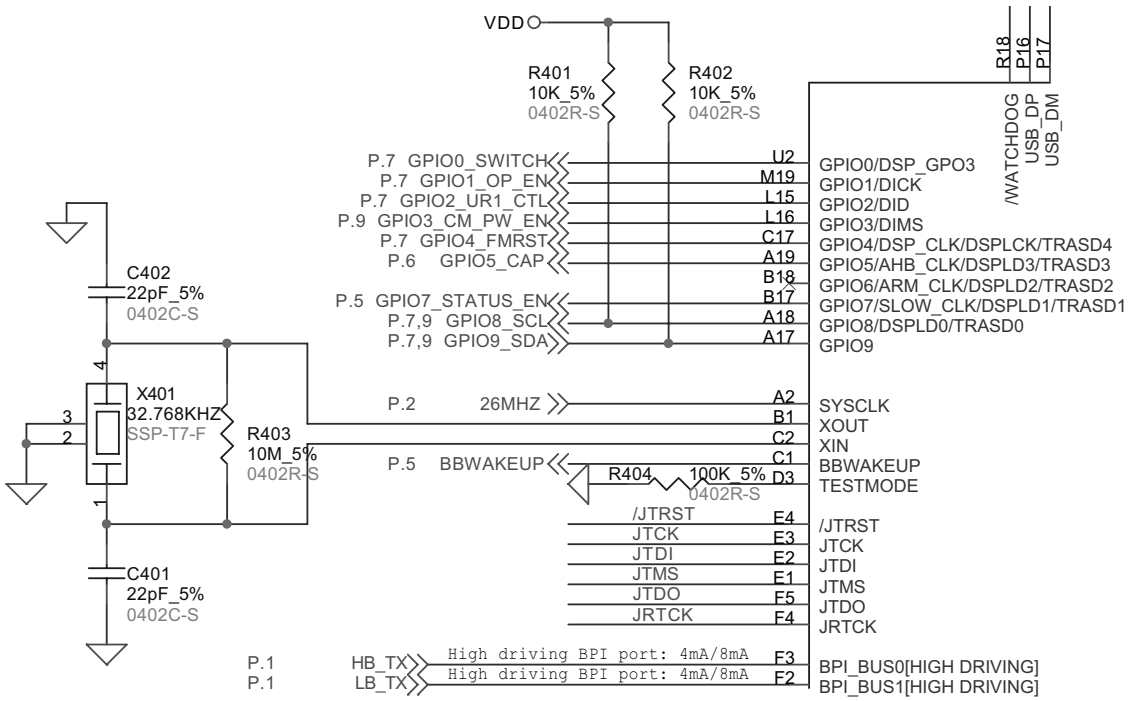
Vbat	CHRON	CHRCNTL	CHRDET	-UVLO	BATUSE	Charger Condition
Any Vbat	L	X	L	X	X	No-Charging
Vbat > 3.2V	X	L	X	X	X	No-Charging
Vbat < UVLO	H	X	L	L	X	Pre-Charging
3.2V<Vbat<4.2V	H	H	H	H	L	CC mode
ADC5_USB	H	H	H	H	L	CV mode
ADC6_ASS_ID	H	H	H	H	H	CC mode

Notes: OV terminates charging at 4.3V for Li-ion battery or 5.1V for NiMH battery.

4.2.10 REAL-TIME CLOCK (RTC)

RTC is the feature to count “second”.

MTK6226’s clock generation on 32.768kHz is made by OSC(X401 in 7332), connecting to OSC32K_IN/ OSC32K_OUT and supply the clock to 6305.



The real-time clock (RTC) is driven by a 32.768 kHz clock from a crystal oscillator. The input clock is divided by 32.768 to generate a clock with a 1 second period. In addition, it can generate interrupts at a programmed time. The following are basic function of RTC:

-Time information (seconds/minutes/hours) coded in BCD

-Calendar information (Day/Month/Year/Day of the week) directly in BCD code up to year 2099.

-Alarm function with interrupts generation bases on a periodical (second/minute/hour/day) or a precise time event in the century (second accuracy).

-30s time range correction

-32khz oscillator frequency gauging.

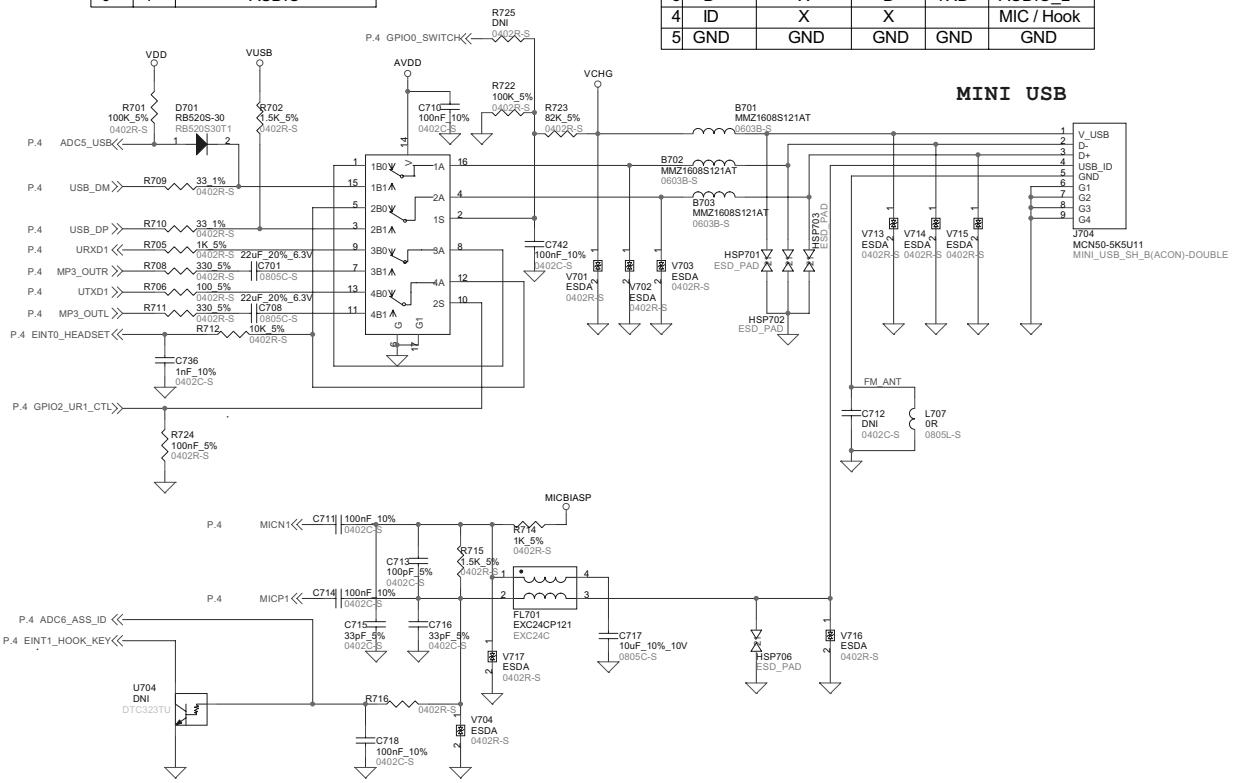
The RTC module of 7332 is supplied by 3V Backup Battery made by Sanyo. The target of running time of the backup battery (fully charged) is longer than two hours after the main battery is removed.

4.2.11 EXTERNAL INTERFACE

The pin arrangement of system I/O is shown below.

FSA2467 Function Select		
1S	2S	Function Mode
1	X	USB
0	0	UART
0	1	AUDIO

Accessory PIN Define					
		Charger	USB	UART	Hands-free
1	V_USB	Charger_in	V_USB	X	X
2	D-	X	D-	RXD	AUDIO_R
3	D+	X	D+	TXD	AUDIO_L
4	ID	X	X		MIC / Hook
5	GND	GND	GND	GND	GND



4.2.12 SIM INTERFACE

The SIM interface module within MTK6226 allows access to the subscriber identity module smart card. With the appropriate software and level conversion by MT6305, the interface is compliant with GSM 11.11 and GSM 11.12.

The electrical interface consists of five signals:

SIMVCC

This output connects to contact C306 (VCC) of the SIM connector. It is used to supply power to the SIM card and is supplied directly from MT6305.

It is controlled by MTK6226 , and enable the power and 3V operation respectively. Note that while SIMPWR is low, the software sets SIMRST, SIMCLK and SIMDATA signals low.

SIMRST

This output connects to contact V502 (RST) of the SIM connector. It is set directly by the CPU writing to the SIM control register.

SIMCLK

This output connects to contact V501 (CLK) of the SIM connector. The clock may be set high or low, or a choice of 13/4 MHz or 13/12 MHz clock frequencies may be selected, by writing to the SIM control register. In order to save power, the clock should be stopped when not required, if the SIM allows it.

SIMDATA

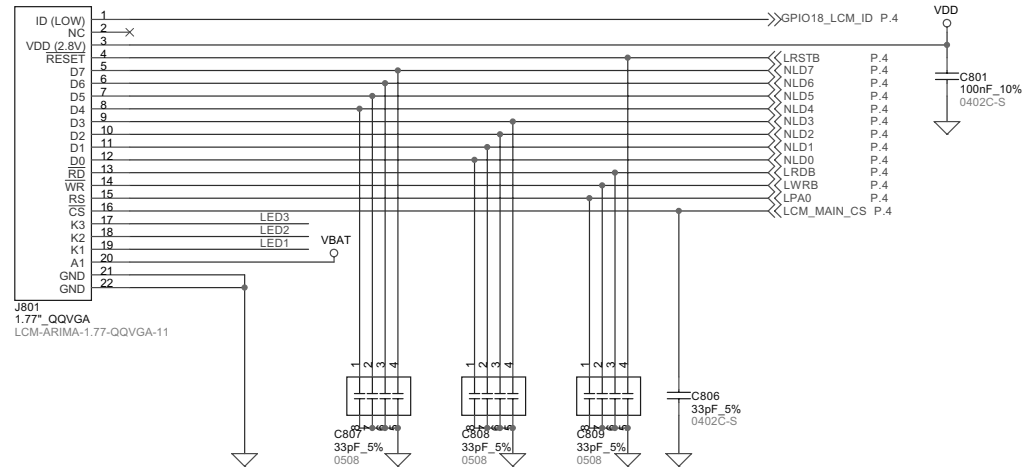
This is a bi-directional, open drain signal, connected to contact V504 (I/O) of the SIM connector. Control of the data signal is done in the SIM interface section of MTK6226, although the output can be disabled by writing to the SIM control register. Being opendrain with an external pull-up, the output floats high when not being driven low by either Trident-HP or the SIM card.

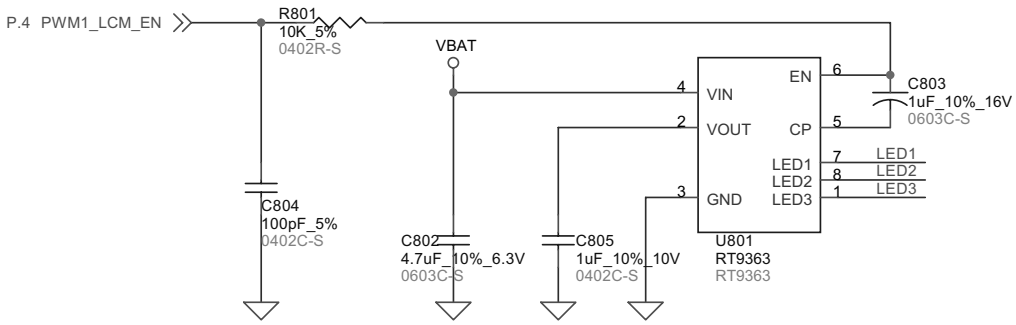
All the above control signals maintain their state when MTK6226 is powered down. This allows the SIM to remain powered during soft-OFF. SIMPWR should be switched OFF when handset °Æhard-OFF' mode is selected.

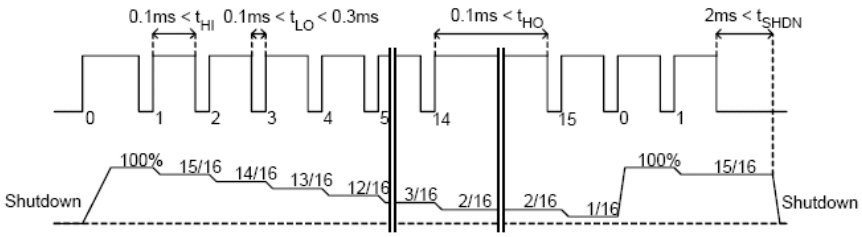
4.2.13 SIGNAL CONTROL PATH FOR BACKLIGHT LED, CAMERA FLASH LED AND INDICATOR LED

4.2.13.1 Backlight LED Control

The LCD backlight is controlled by the PWL signal from the MTK6226. The backlight is turned on when PWM1_LCM_EN is high. The LCD backlight a 5V power supply. The RT9396 DC/DC converter (U801) generates the singal for LED1,LED2 ,LED3 Detailed circuit diagram is as shown below.





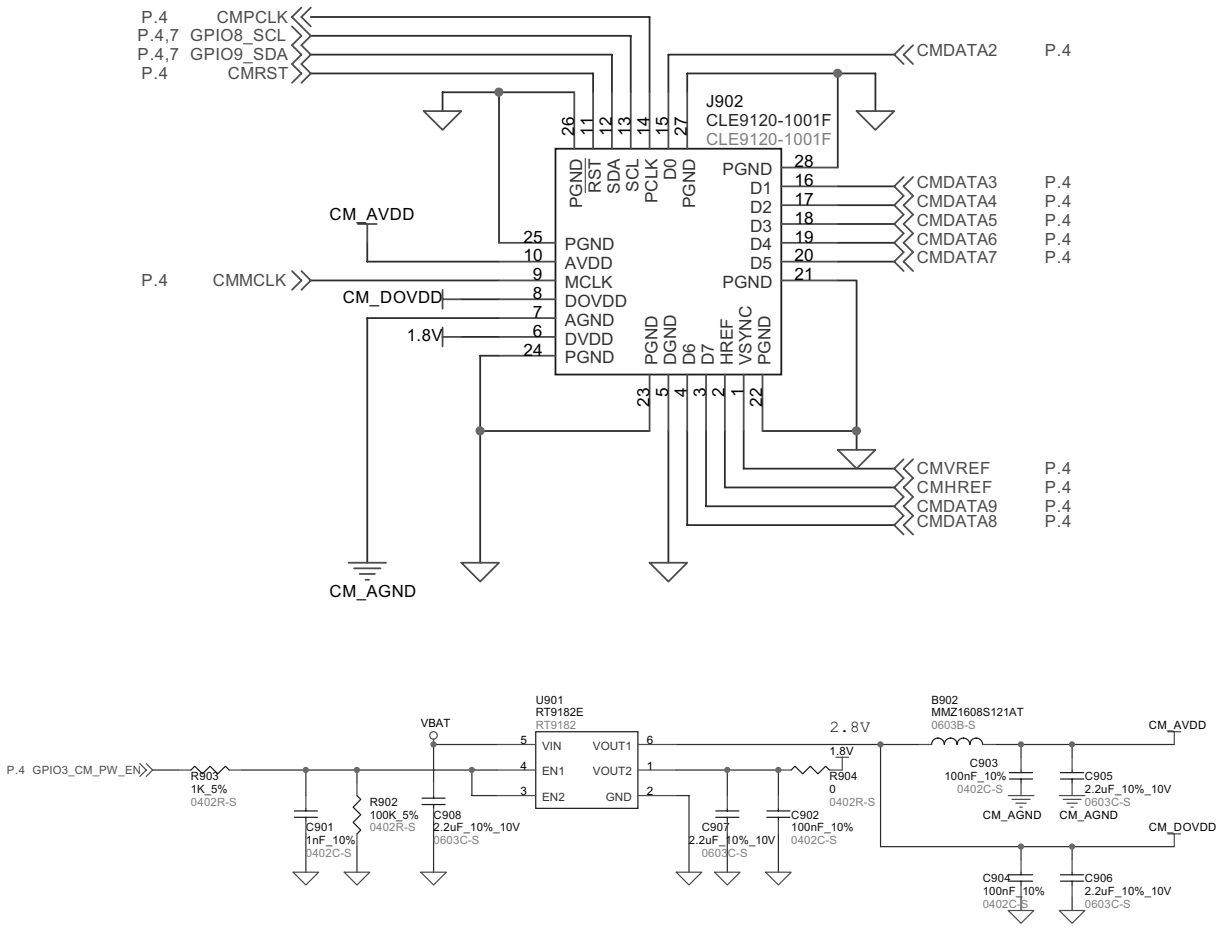


Brightness control by pulse dimming. RT9363 implements 16 steps brightness control

4.2.13.2 Camera Control

Overview of voltage supply for Camera

RT9182 provides power supply for Camera shown below.



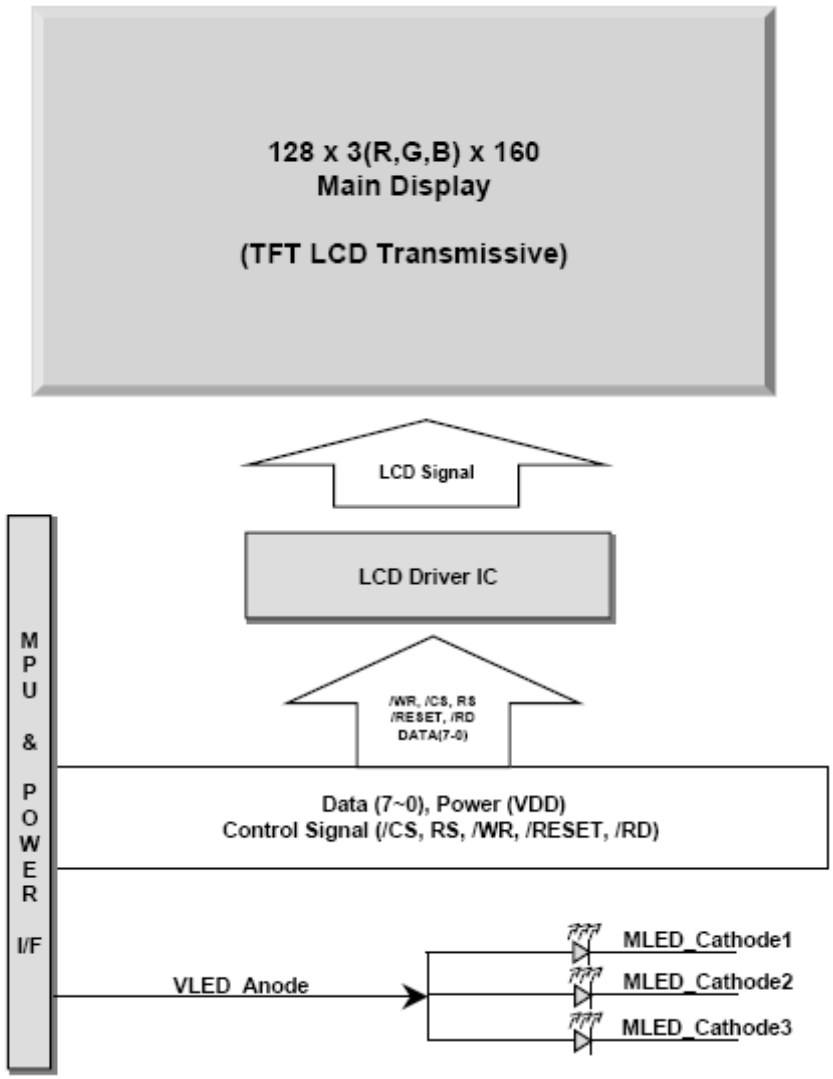
4.2.14 DISPLAY SYSTEM

4.2.14.1 TFT LCD Module

The IM177BBNBA model is a Color TFT LCD supplied by LG Innotek.
This Module has a 1.77 inch diagonally measured active display area with 128(RGB)X160 resolution
Each pixel is divided into Red, Green and Blue sub-pixels and dots which are arranged in vertical stripes.
LCD color is determined with 262K Colors signal for each pixel. The IM177BBNBA has been designed to apply the interface method that enables low power, high speed, and high contrast.
The IM177BBNBA is intended to support applications where thin thickness, wide viewing angle and low power are critical factors and graphic displays are important.

Item	Main Display	Remark
Display Mode	Normally White, Transmissive LCD	
Driving Method	TFT Active Matrix	
Input Signals	8bit CPU I/F Parallel	
Outside Dimensions	33.9mm(W) x 46.4mm(H) x 2.1mm(D) (Typ.)	
Active Area	28.032mm(W) X 35.04mm(H)	
Number of Pixels	128xRGBx160 Pixels	Note 1)
Pixel Pitch	0.219mm(H) X 0.219mm(W)	Note 1)
Pixel Arrangement	RGB Vertical stripes	Note 1)

4.2.14.2 LCD interface



4.2.15 CAMERA

4.2.15.1 Camera Module

This camera Module is designed for Mobile Phone application, which consists of low voltage CMOS image sensors that provide the full functionality of a VGA (640 x 480) camera and image processor in a single System On Chip (SOC). This product has an image array capable of operating at up to 30 frames per second (fps) with completely controlling over image quality, formatting and output data transfer. All required image processing functions, including exposure control, gamma, white balance, color saturation, hue control and more, are also programmable through the Serial Camera Control Bus (SCCB) interface.

4.2.15.2 Specifications

- CMOS Sensor: OmniVision OV7670
- Pixel Resolution: 640 X 480(VGA~QQVGA)
- Optical Size: 1/6" Optical Format
- Pixel Pitch: 3.6um X 3.6um
- Image Size: 2.36mm X 1.76mm
- Color Filter: RGB Bayer Format
- Frame Rate: VGA-30 fps Max, QVGA-60 fps Max
- Output Format: YUV/YCbCr(4:2:2) GRB(4:2:2) Raw RGB
- Power Consumption: 60 mW(15fps VGA YUV format)
- Power Supply Voltage: Digital core +1.8V+10%
  Analog Power: DC 2.45V to 3.0V I/O
  Power : DC 2.45V to 3.0V
- Master clock frequency: 10 ~ 48 MHz,Typ:24 MHz
- Exposure: AUTO , Manual:
- Exposure Time: 523 trow
- White Balance: AUTO, Manual
- Interface: SCCB Bus
- Operating Temperature: 0 to 50 Centigrade
- Storage Temperature: -40 to 80 Centigrade

4.2.16 AUDIO SUBSYSTEM

4.2.16.1 Outline

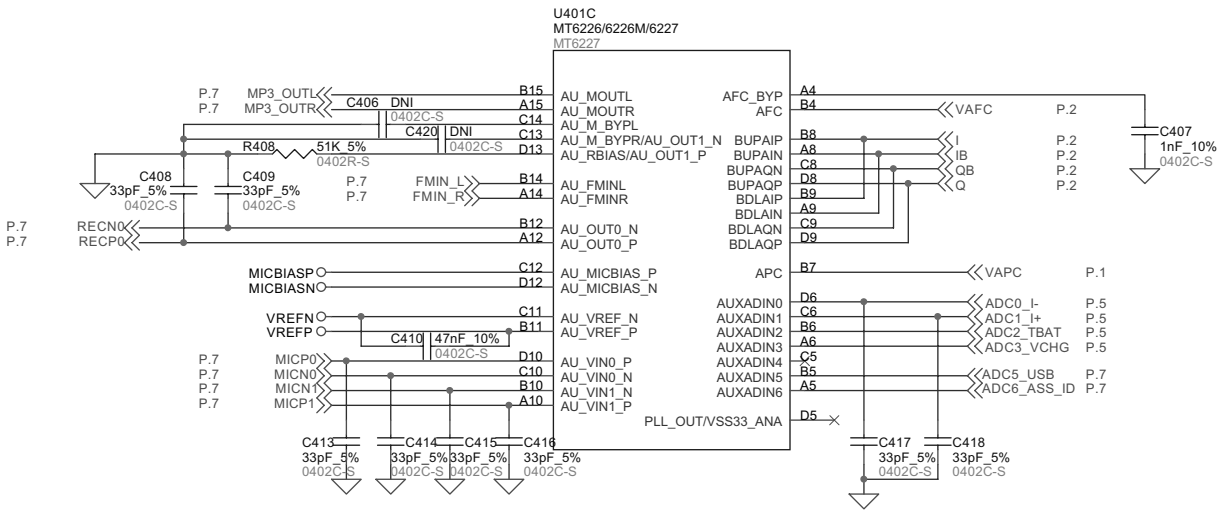
The audio system is composed of MTK6226, PMU IC (MT6305). The attached device is MIC, Receiver, Speaker.

4.2.16.2 Interface

Using a highly integrated mixed-signal Audio Front-End, the MT6226 architecture allows for easy audio interfacing with direct connection to the audio transducers. The audio interface integrates D/A and A/D Converters for Voice band, as well as high resolution Stereo D/A Converters for Audio band. In addition, MT6226 also provides Stereo Input and Analog Mux.

MT6226 supports AMR codec to adaptively optimize speech and audio quality. Moreover, HE-AAC codec is implemented to deliver CD-quality audio at low bit rates.

Overall, MT6226's audio features provide a rich platform for multi-media applications.

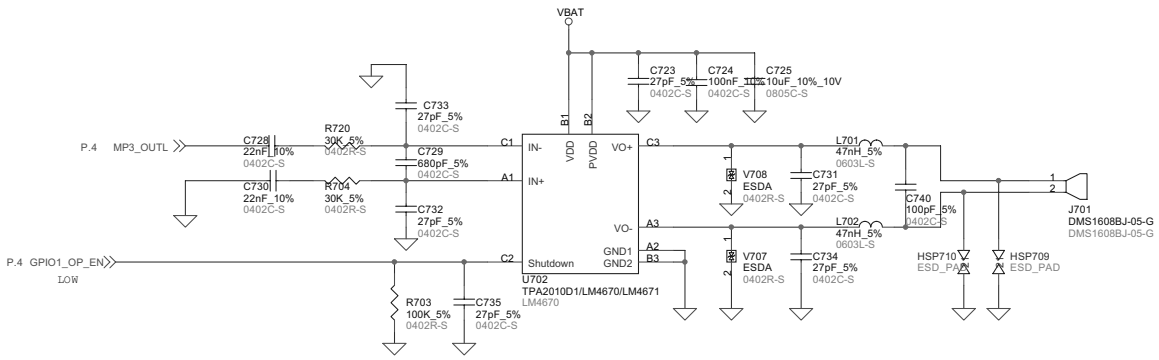


NEC Confidential & Proprietary

4.2.16.3 Audio Control

Speaker interface

Use U702 to ampfily voice and voice singal from MP3_OUTL

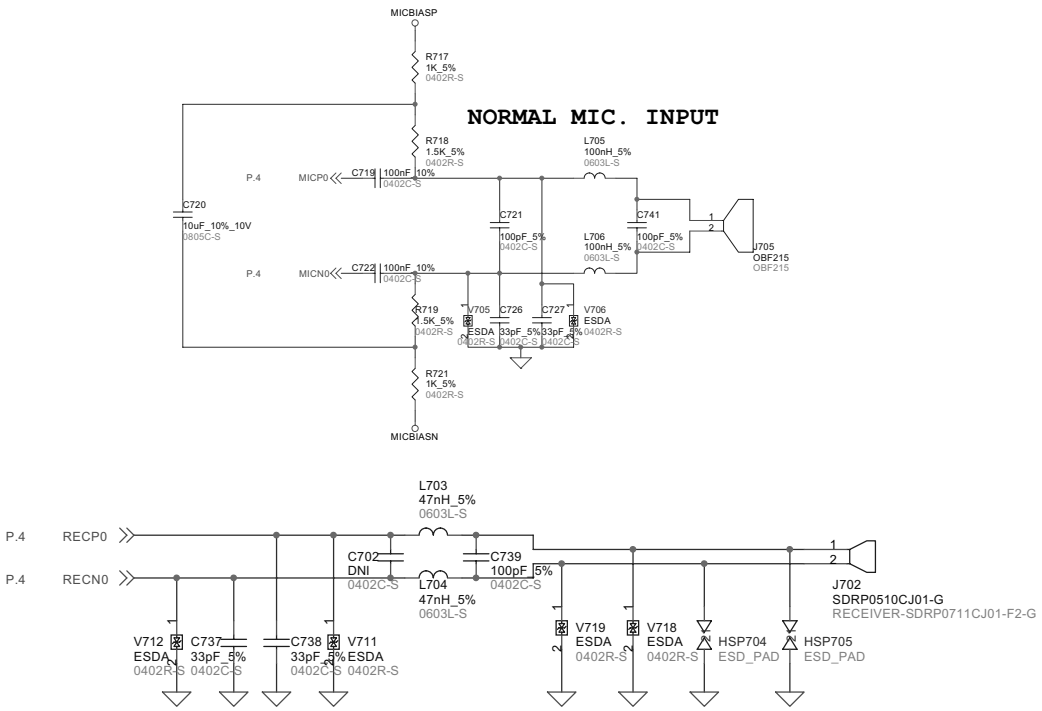


SPEAKER AMPLIFIER

Receiver and Microphone

The receiver is a 32ßŸ dynamic type and is driven directly from MT6305.

The Microphone is also directly connected to MT6305 MICIP0 and MICIN0.

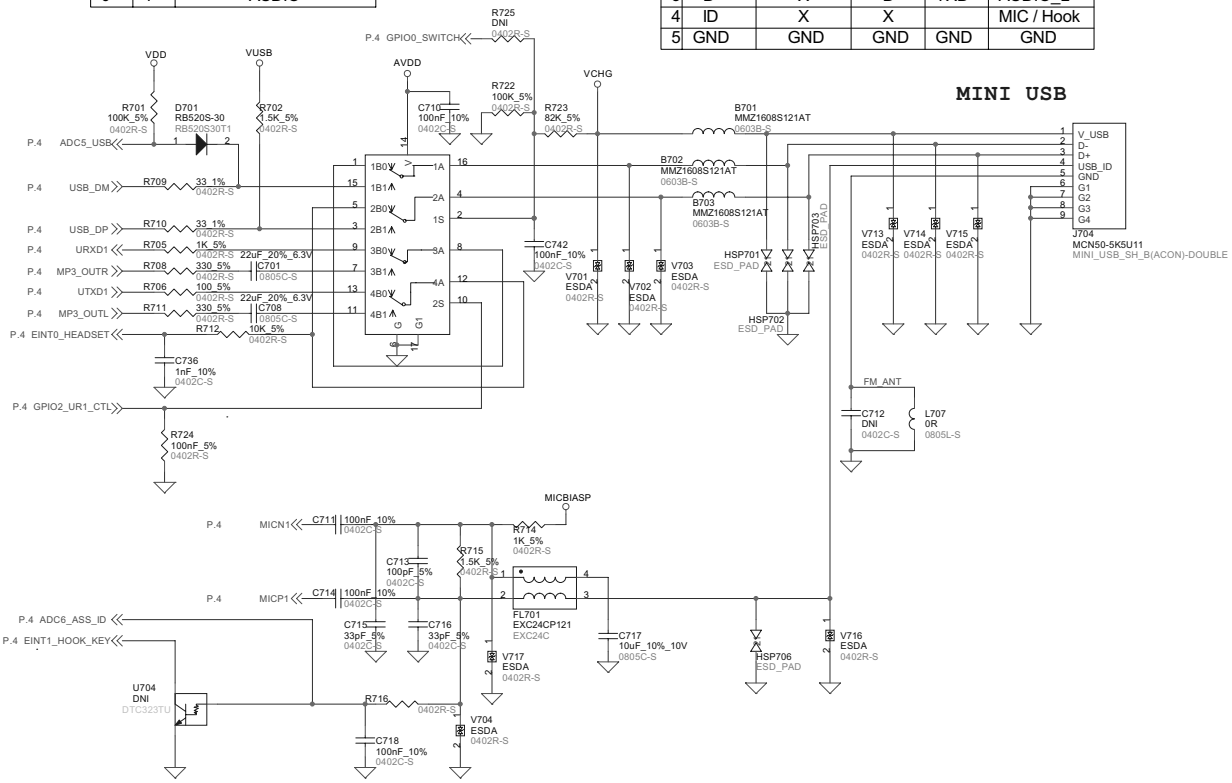


RECEIVER

Hands Free Interface

FSA2467 Function Select		
1S	2S	Function Mode
1	X	USB
0	0	UART
0	1	AUDIO

Accessory PIN Define					
		Charger	USB	UART	Hands-free
1	V_USB	Charger_in	V_USB	X	X
2	D-	X	D-	RXD	AUDIO_R
3	D+	X	D+	TXD	AUDIO_L
4	ID	X	X		MIC / Hook
5	GND	GND	GND	GND	GND



4.2.17 FM interface

MT6226 integrates a mixed-signal Baseband front-end in order to provide a well-organized radio interface with flexibility for efficient customization. It contains gain and offset calibration mechanisms, and filters with programmable coefficients for comprehensive compatibility control on RF modules. This approach also allows the usage of a high resolution D/A Converter for controlling VCXO or crystal, thus reducing the need for expensive TCVCXO.
MT6226 achieves great MODEM performance by utilizing 14-bit high resolution A/D Converter in the RF downlink path.
Furthermore, to reduce the need for extra external current-driving component, the driving strength of some BPI outputs is designed to be configurable.

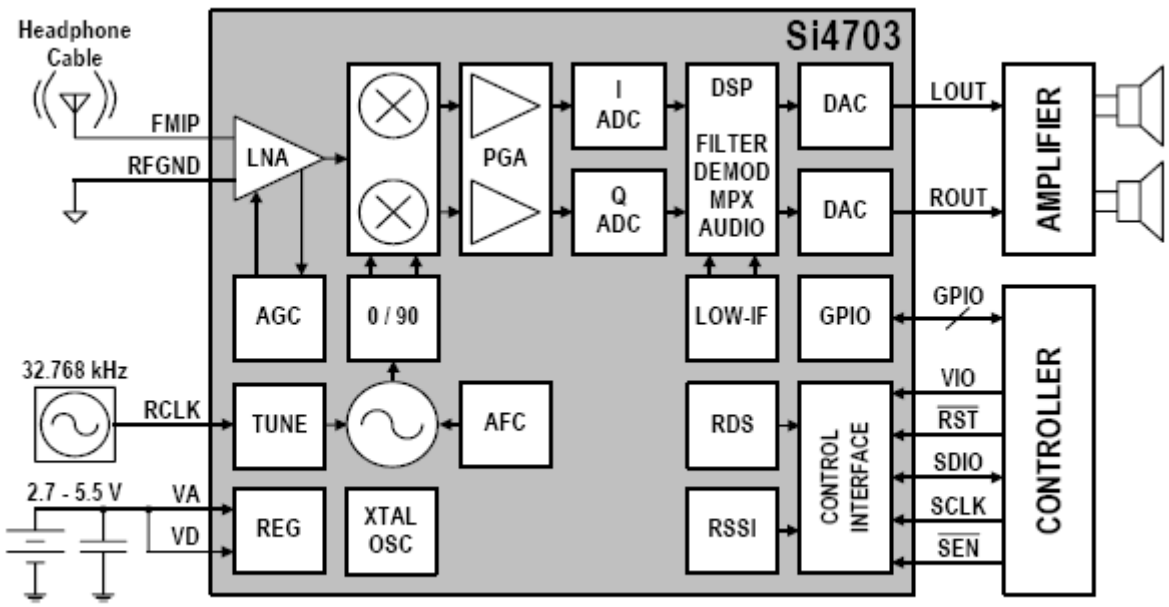
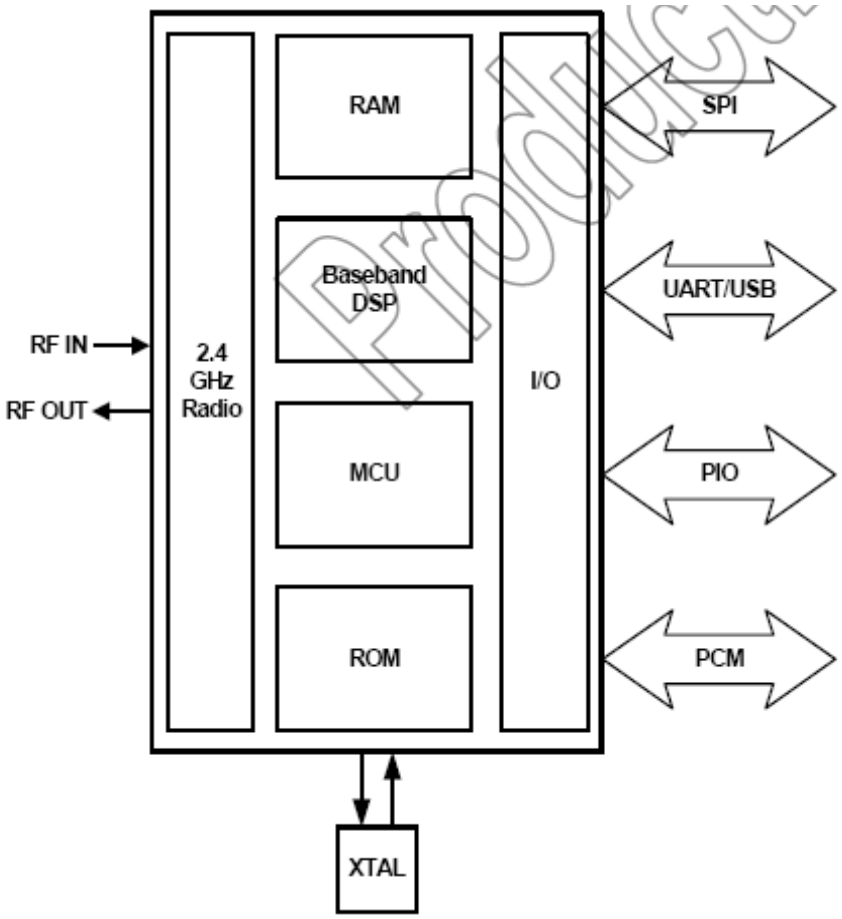


Figure 7. Si4703 FM Receiver Block Diagram

4.2.18 Bluetooth interface

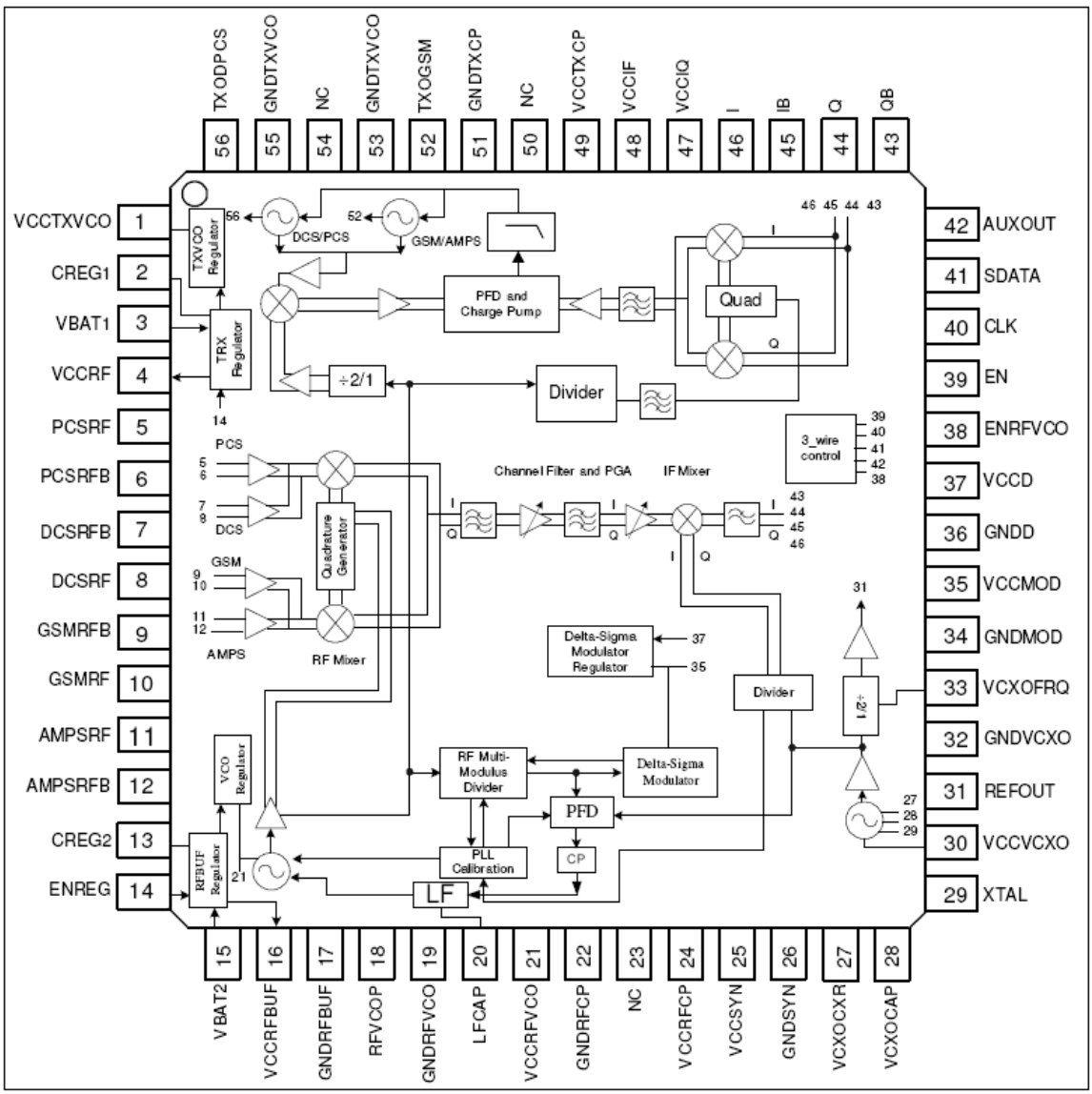
BuleCore3-ROM CSP is singal chip radio and baseband chip for Bluetooth wireless technology 2.4G Hz system.it is implemented in 0.18um CMOS technology.
The 4Mbit ROM is metal programmable,which enables an eight week turn-around from approval of firmare to production samples.



BlueCore3-ROM CSP System Architecture

4.2.19 RF Sub-systems

MT6129 is a highly integrated RF transceiver IC for multi-band Global Systems for Mobile communication (GSM) and General Packet Radio Service (GPRS) cellular system applications. The MT6129 includes four LNAs, two RF quadrature mixers, an integrated channel filter, programmable gain amplifiers (PGA), an IQ demodulator for the receiver, a precision IQ modulator with offset PLL for the transmitter, two internal TX VCOs, a VCXO, on-chip regulators, and a fully programmable sigma-delta fractional-N synthesizer with an on-chip RF VCO. The MT6129 also includes control circuits to enable different operating modes. The device is housed in a 56-pin QFN SMD package with a downset paddle for additional grounding.



4.2.19.1 Receiver

The receiver section of MT6129 includes Quad-band low noise amplifiers (LNAs), RF quadrature mixers, an on-chip channel filter, Programmable Gain Amplifiers (PGAs), quadrature second mixers, and a final low-pass filter. The very low-IF MT6129 uses imagerejection mixers and filters to eliminate interference. With accurate RF quadrature signal generation and mixer matching techniques, the image rejection of the MT6129 can reach 35 dB for all bands. The fully integrated channel filters rejects interference, blocking signals, and images without any external components.

Compared to a direct conversion receiver (DCR), MT6129's very low-IF architecture improves the blocking rejection, AM suppression, as well as the adjacent channel interference performance. Moreover, the very low-IF architecture eliminates the need for complicated DC offset calibration that is necessary in a DCR architecture. In addition, the common-mode balance requirement of the SAW filter input is relaxed. The MT6129 provides the analog IQ baseband output without any extra frequency conversion components.

The MT6129 includes four differential LNAs for GSM 850 (869 MHz - 893 MHz), E-GSM 900 (925 MHz-960 MHz), DCS 1800 (1805 MHz-1880 MHz) and PCS 1900 (1930 MHz - 1990 MHz). The differential inputs are matched to 200 _ SAW filters using LC networks. The gain of the LNAs can be controlled either high or low for an additional 35 dB dynamic range control. Following the LNAs are the image-rejection quadrature RF mixers that down-convert the RF signal to the IF frequency. No external components are needed at the output of the RF mixers.

The IF signal is then filtered and amplified through an image-rejection filter and a PGA.

The multi-stage PGA is implemented between filtering stages to control the gain of the receiver. With 2 dB gain steps, a 78 dB dynamic range of the PGA ensures a proper signal level for demodulation. The quadrature 2nd mixers are provided on-chip to down convert IF signal to baseband in an analog differential IQ format.

4.2.19.2 Transmitter

The MT6129 transmitter section consists of two on-chip TX VCOs, buffer amplifiers, a down-converting mixer, a quadrature modulator, an analog phase detector (PD) and a digital phase frequency detector (PFD), each with a charge pump output and on chip loop filter.

The dividers and loop filters are used to achieve the desired IF frequency from the downconversion mixer and quadrature modulator. For a given transmission channel, the transmitter will select one of the two different TX reference dividing numbers. These built-in components, along with an internal voltage controlled oscillator (TX VCO) and a loop filter, implement a translation loop modulator. The TX VCO output is fed to the power amplifier (PA). A control loop, implemented externally, is used to control the PA's output power level.

4.2.19.3 TX VCO

Two power VCOs are integrated with OPLL to form a complete transmitter circuit. The TX VCO output power is typically 9 dBm with +/- 2.5dB variation in E-GSM900/ GSM850 bands and +8 dBm output powers with +/- 2dB variation in DCS1800/ PCS1900 bands over extreme temperature conditions. Inside the chip, the VCO differential output signals are fed into the output buffer, the OPLL input feedback buffer, and the calibration circuit. The off chip signal is transformed into a single ended output which needs impedance matching to 50_to drive the power amplifier. Like RF VCO, the oscillation bandwidth is partitioned into 128 (or 64) sub-bands for DCS/ PCS (for E-GSM900/ GSM850) TX VCO to cover the process and temperature variation. Calibration process begins after a period of programmable time when the on chip TX VCO regulator is turned on. Total calibration time needs about 60us maximally and the frequency error after calibration is within +/-5 MHz. For Vtune = 1.2 V, the variation of kvco is about 14% and 40% for GSM and DCS/PCS TX VCO, respectively, across the desired frequency range.

4.2.19.4 Frequency Synthesizer

The MT6129 includes a frequency synthesizer with a fully integrated RF VCO to generate RX and TX local oscillator frequencies. The PLL locks the RF VCO to a precision reference frequency at 26 MHz. In order to reduce the inherent spur caused by fractional-N synthesizers, a 3rd-order sigma-delta modulator with dithering function is used to generate the prescaler divider number N. The prescaler is based on a multi-modulus architecture with programmable divider numbers ranging from 64 to 127. A conventional digital-type PFD with a charge pump is used for phase comparison in the PLL. By changing the output current of the charge pump, the phase detector gain can be programmed from75/_ _A/rad to 600/_ _A/rad.

To reduce the acquisition time or to enable fast settling time for multi-slot data services such as GPRS, a digital loop (calibration loop) along with a fast-acquisition system are implemented in the synthesizer. Once the synthesizer is programmed, the RF VCO is preset to the vicinity of the desired frequency by a digital calibration loop. After the calibration, a fast-acquisition system is utilized for a period of time to facilitate fast locking. Once the acquisition is done, the PLL reverts back to the normal operation mode.

4.2.19.5 Voltage Control Crystal Oscillator

Voltage Control Crystal Oscillator (VCXO) consists of an amplifier, a buffer, and a programmable capacitor array. The VCXO provides the MT6129 with a selectable reference frequency of either 13 MHz or 26 MHz. The amplifier is designed to be in series resonance with a standard 26 MHz crystal. The crystal is connected from the input pin XTAL of amplifier to ground through a series load capacitance. The buffer provides a typical 600mVpp voltage swing at either 13 MHz or 26 MHz. It is designed to drive a tuned load to improve harmonic contents and reduce the oscillator current consumption. The capacitor array, from 0.0625 pF to 4 pF in steps of 0.0625 pF, is used to shunt the series load capacitor for coarse tuning and remove any fixed offsets due to crystal manufacturing variations. An internal varactor that provides fine tuning combines with the capacitor array. As an alternative, the reference frequency can be provided by an external 26 MHz VCTCXO module.

When pin VCXOCXR is tied to the VCCVCXO supply, the XTAL pin will accept an external signal. Furthermore, the VCXO control pin can be tied to VCCVCXO to prevent the current leakage during the sleep mode operation.

4.2.19.6 Regulator

The MT612X internal regulators provide low noise, stable, temperature and independent supply voltages to critical blocks in the transceiver. An internal P-channel MOSFET pass transistor is used to achieve a low dropout (LDO) voltage of less than 150 mV in all regulators.

SECTION 5

Servicing

5. Servicing

6.1 STRUCTURE

1. KG195

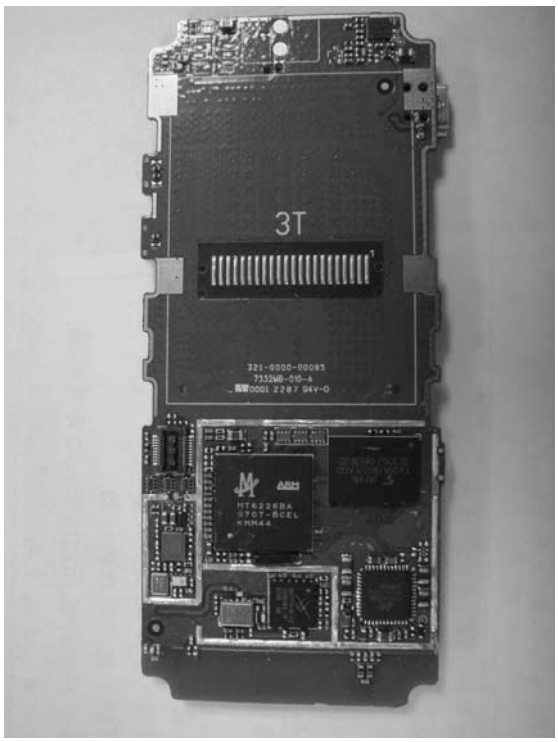
Front View

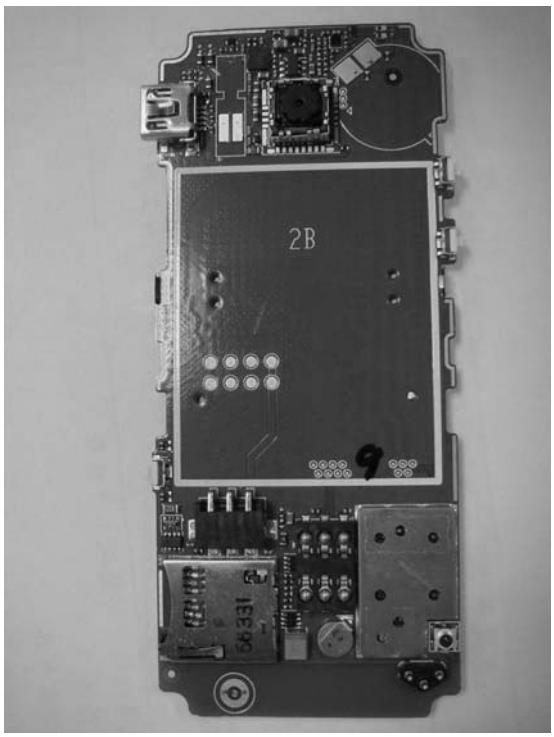
Back View

MAIN BOARD ASSEMBLY

The lower board consists of the following circuits:-

1.Tri band GPRS GSM Transceiver and logic Unit
2.SIM connection socket
3.System I/O connector with charge capability
4.battery terminals
5.Hands free jack
6.Embedded tri band antenna connection terminal
7.Vibrator connection terminal
8.Microphone connection terminal
9.Camera connection terminal
10.Receiver connection terminal
11.Speaker connection terminal
12.SD Card connection terminal
13.LED, camera control and LCD driver circuit



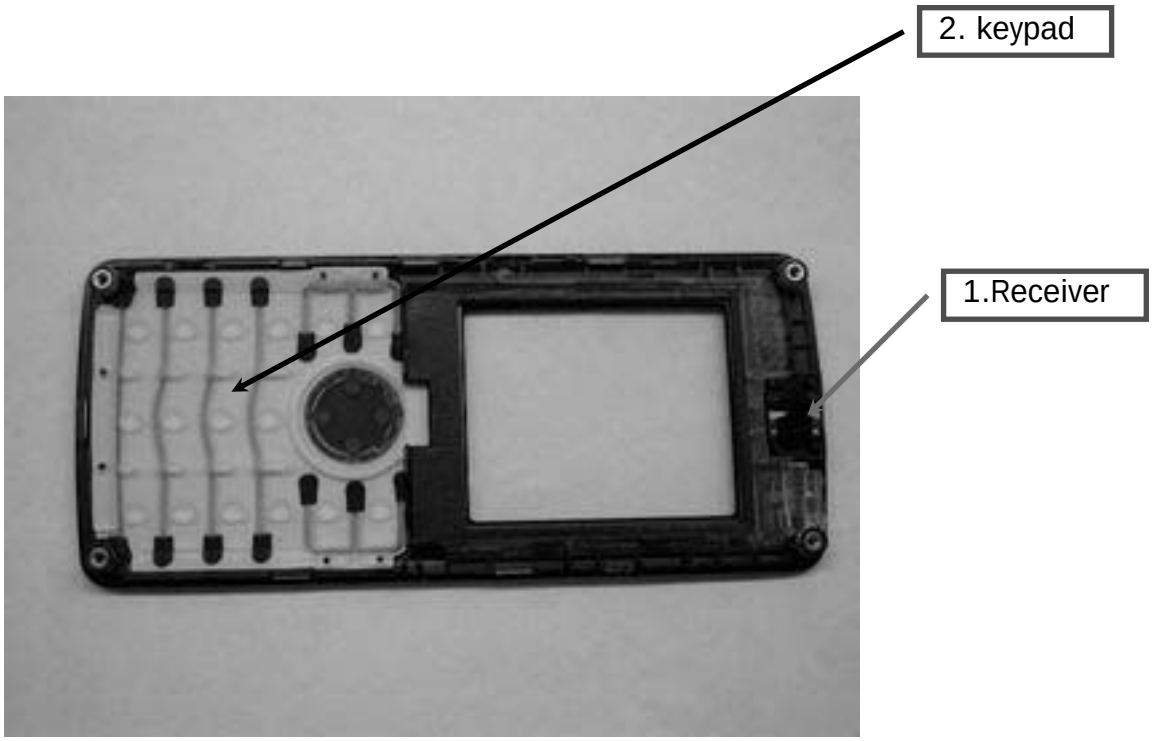


FRONT COVER

The Front cover contains following main parts :-

1.Receiver

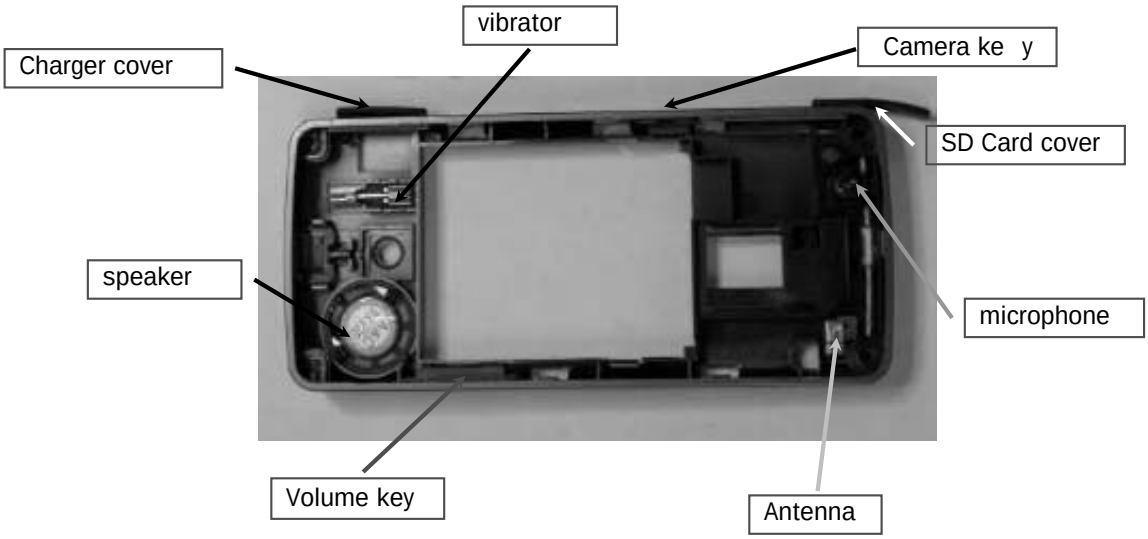
2. Keypad



REAR COVER

The Rear cover contains following main parts :-

1. Speaker
2. Vibrator
3. Microphone
4. Antenna
5. Charger cover
6. SD card cover
7. Volume key
8. Camera key



5.2 ACCESSORIES

BATTERY

AC ADAPTER

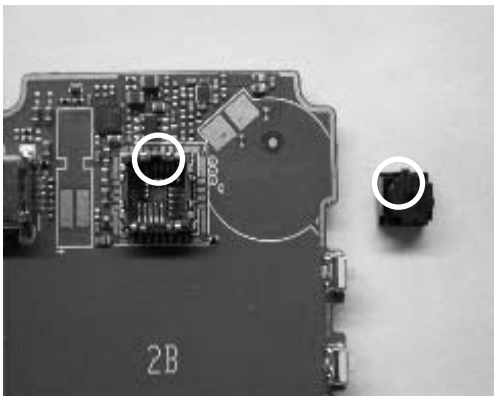
HANDSFREE & DOWNLOAD CABLE

Cable

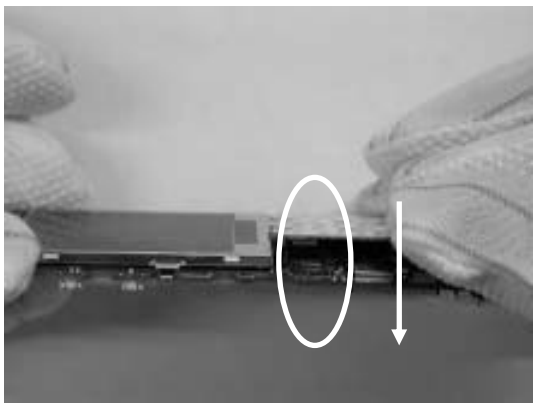
5.3 ASSEMBLY

Assembly

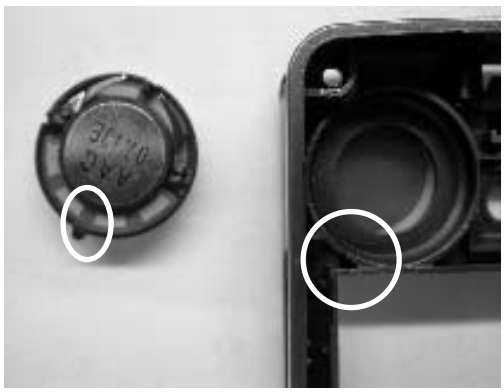
1. Assembly Camera



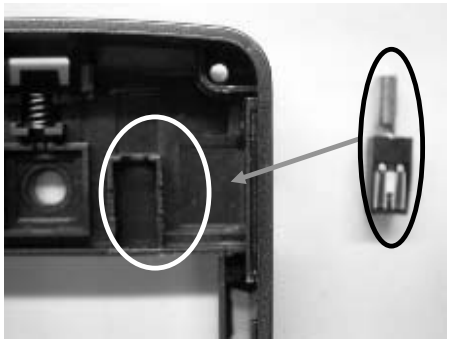
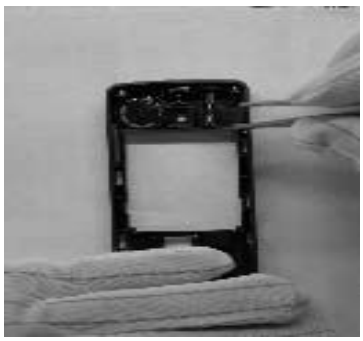
2. Assembly Keypad PCBA



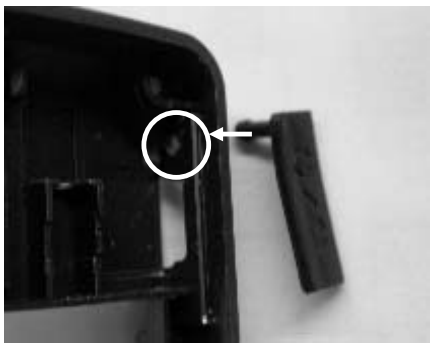
3. Assembly Loudspeaker



4.Assembly Vibrator

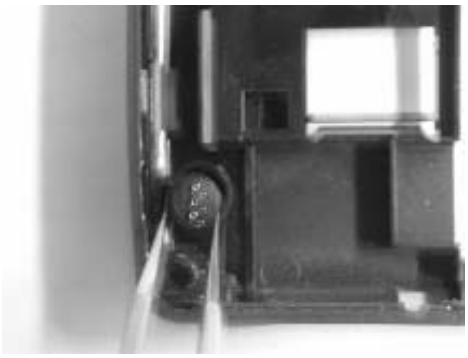
5. Assembly Charger cover




6. Assembly Camera key

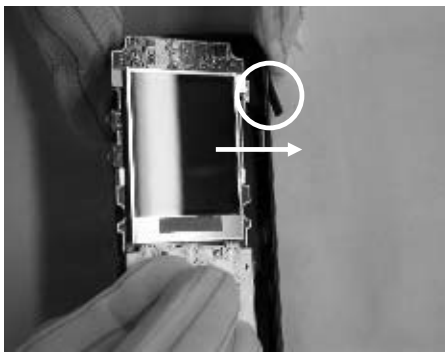
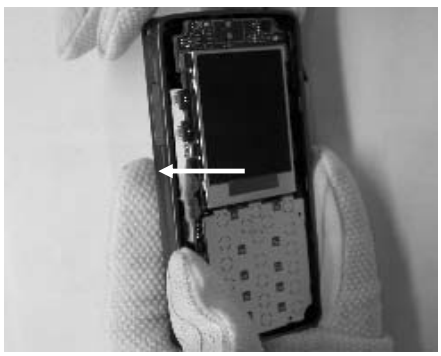

7. Assembly SD card cover


8. Assembly Micphone

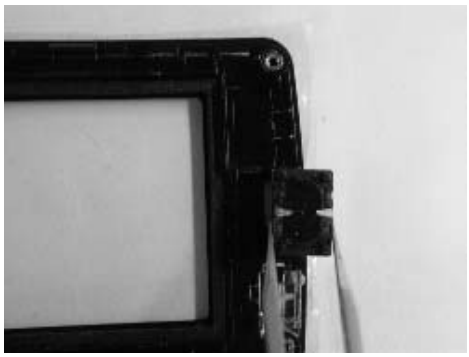



9. Assembly Volume key


10.Assembly Main board

11.Assembly Receiver



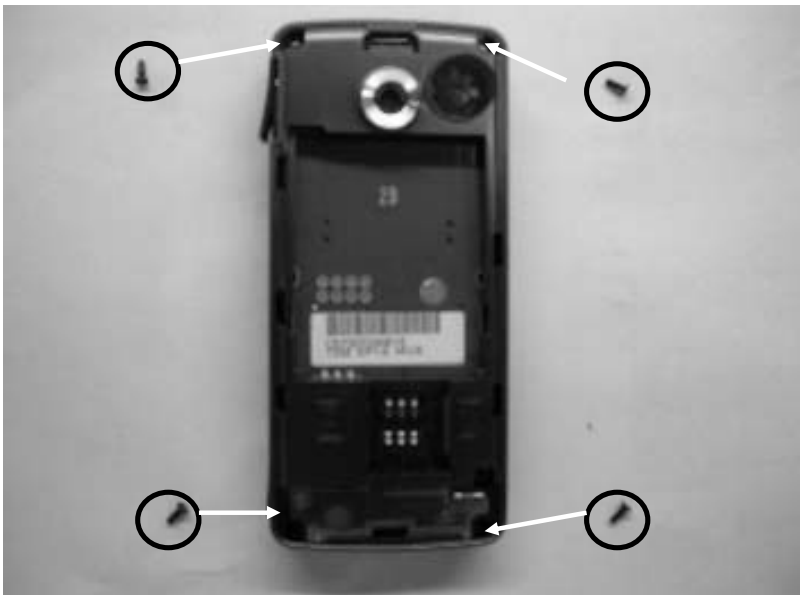

12.Assembly Front cover

5.4 DISASSEMBLY

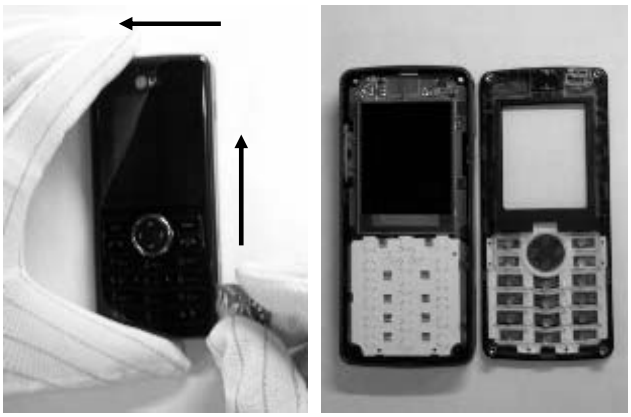
Disassembly

1. Take off battery cover

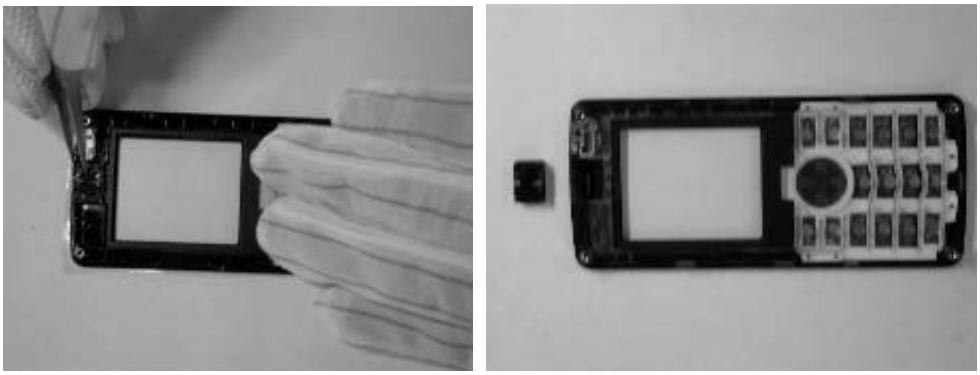
2. Unfasten 4 screws form rear cover.



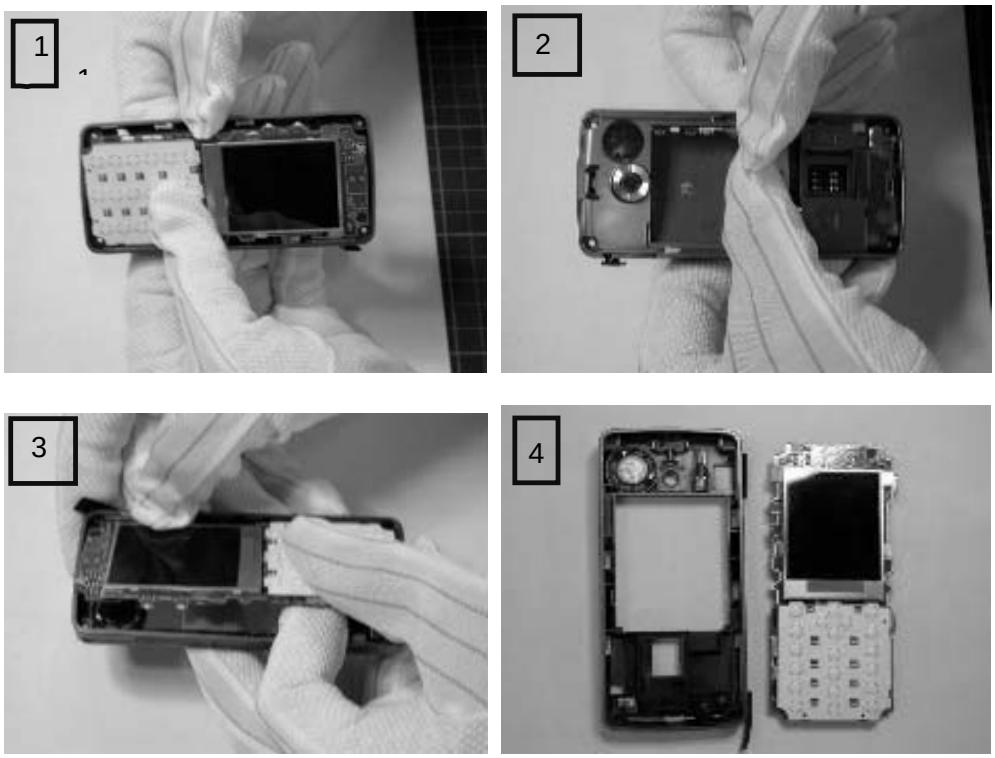
3. Use the Guitar Pick to take off front cover



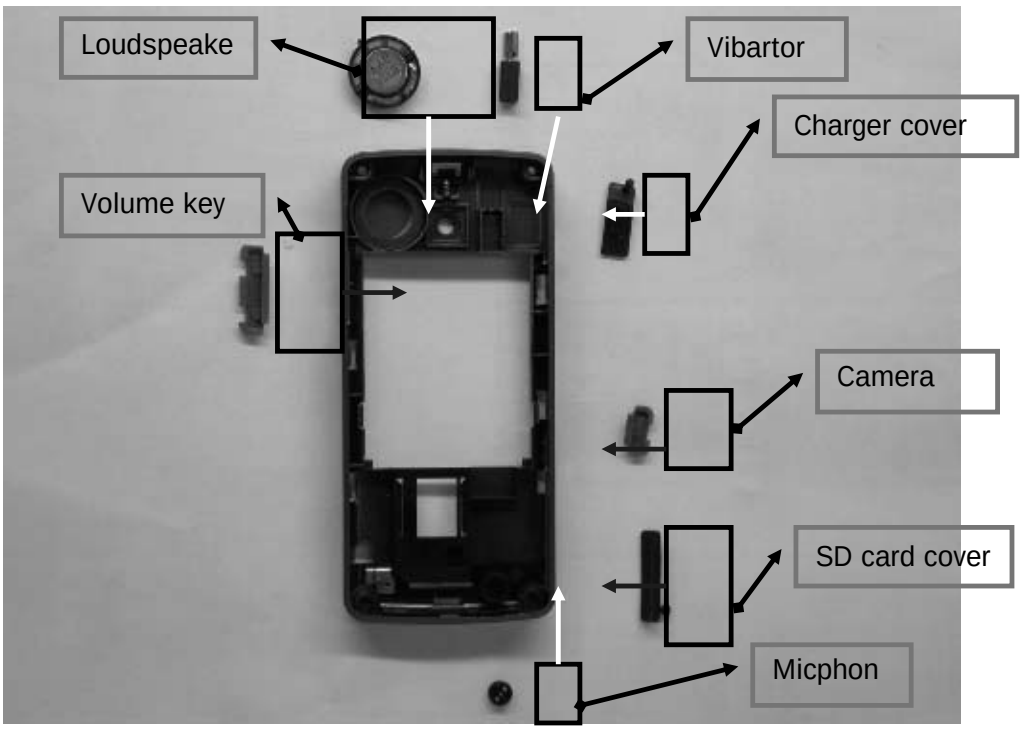
4. Remove the Receiver



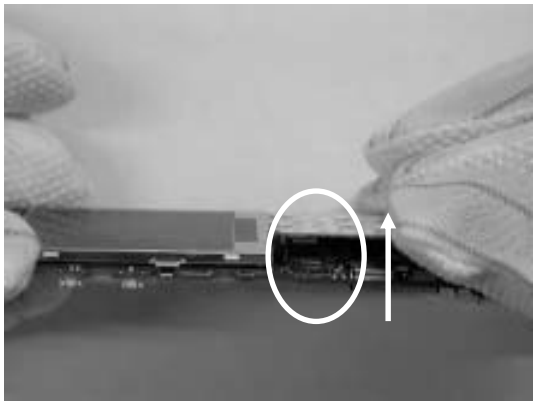
5. Following the step as photos to take off PCBA

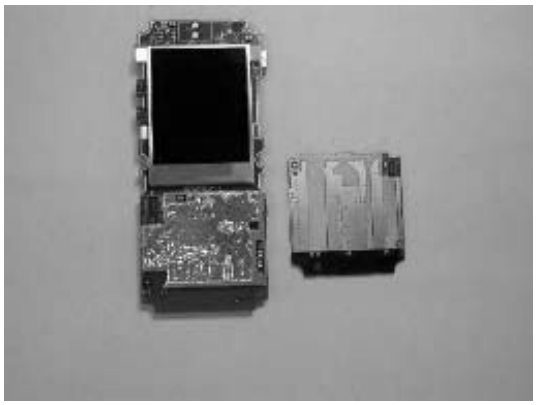


6. Remove loudspeaker, vibrator, charger cover, camera key, SD card cover, Micphone, volume key

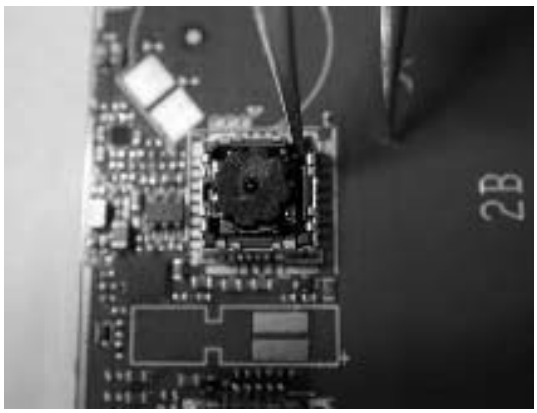


7. Remove keypad PCBA





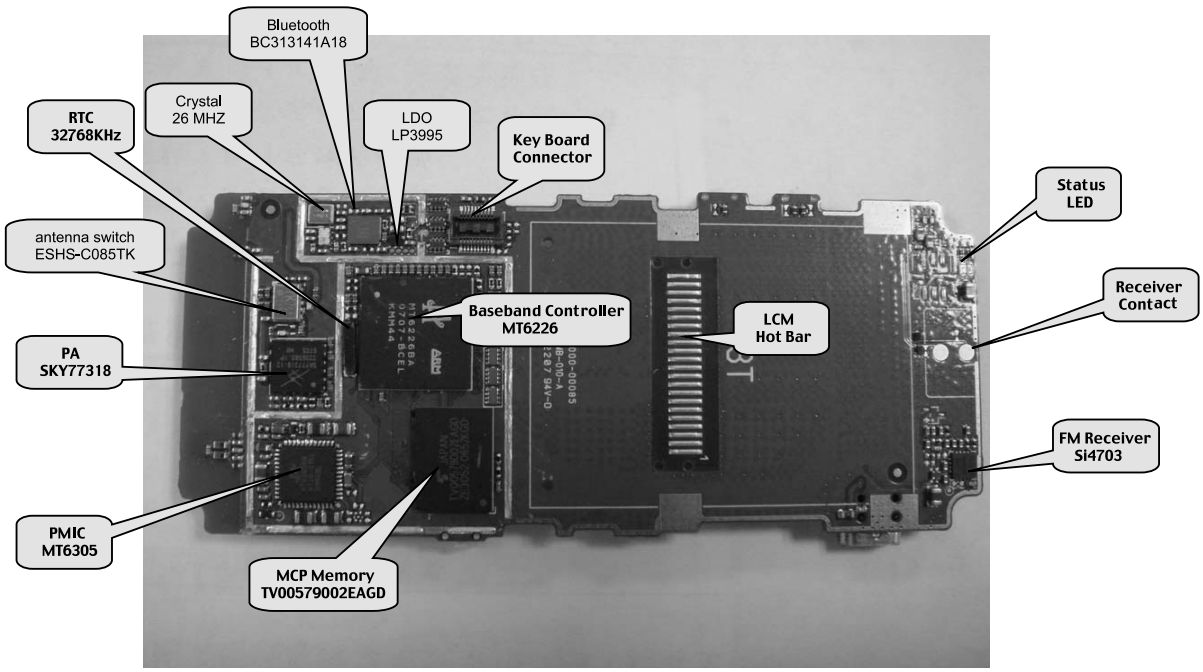
8. Remove camera

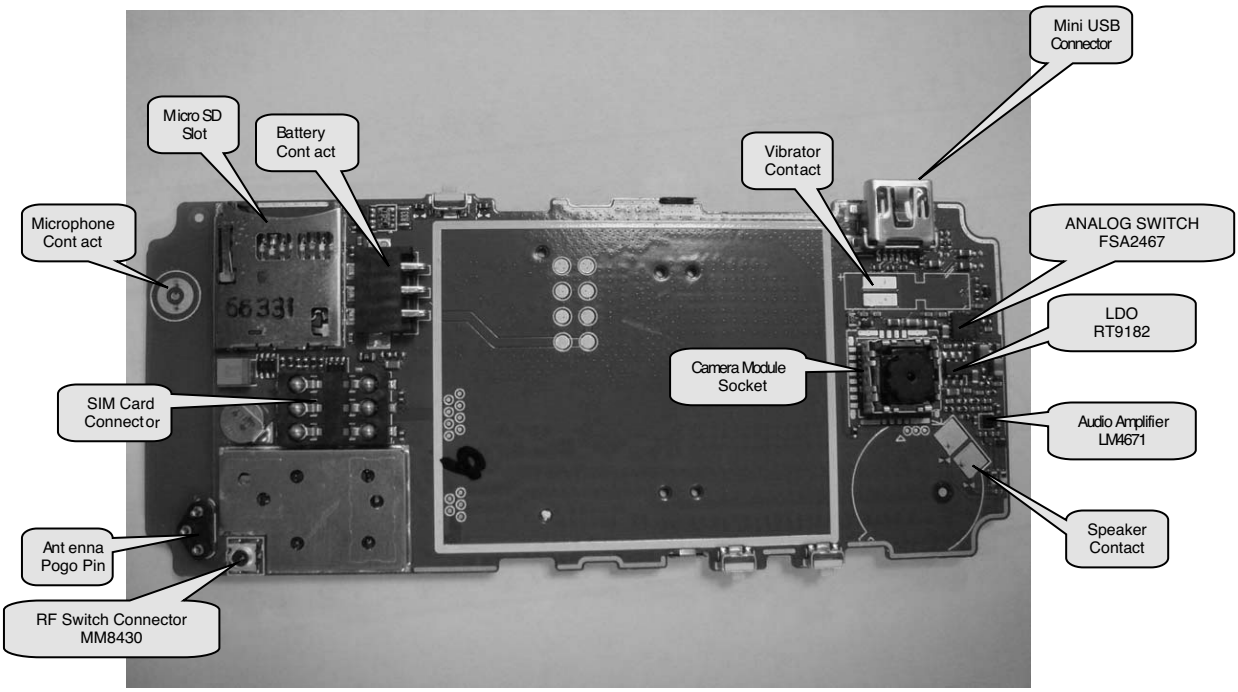


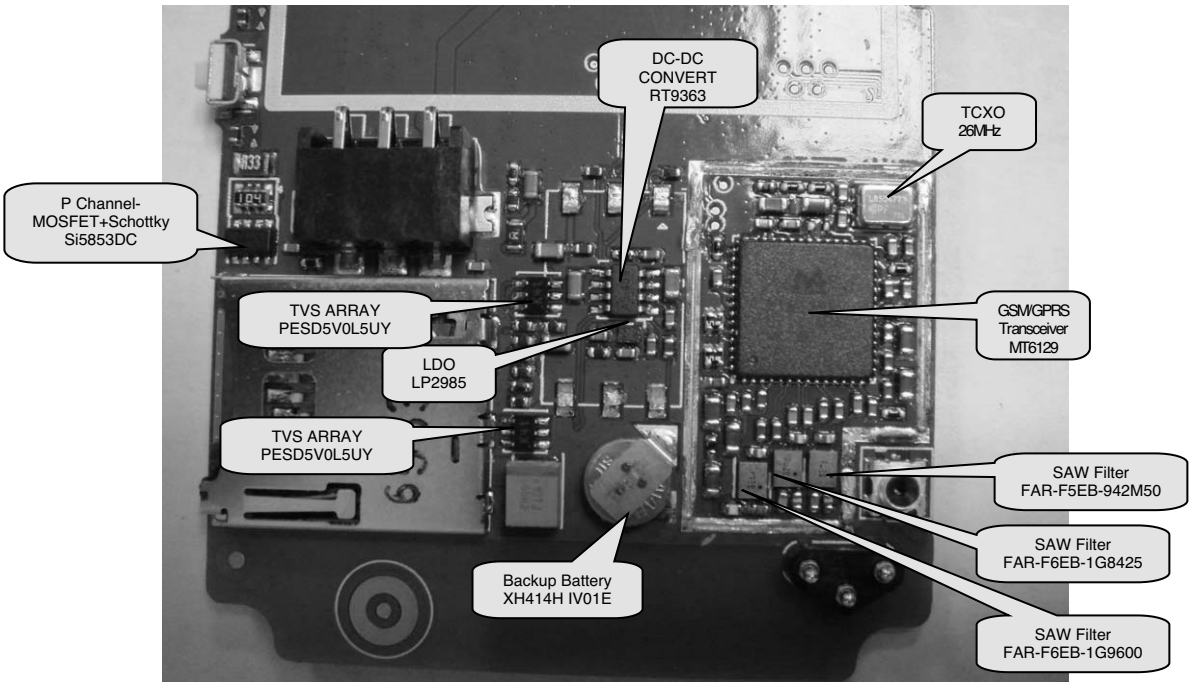
5.5 SOLDERING

SOLDERING PARTS LOCATION

SOLDERING REPAIRED PARTS AT SERVICE LEVEL 2 ARE SHOWN AS BELOW.







Section 6

Repairing

6. Repairing

6.1 TESTING

OVERVIEW

1. Product overview and frequency assignment

Radio Frequency Band	TX E-GSM	880MHz to 915MHz (deltaF=200KHz)
	RX E-GSM	925MHz to 960MHz (deltaF=200KHz)
	TX DCS1800	1710MHz to 1785MHz
	RX DCS1800	1805MHz to 1880MHz
	TX PCS1900	1850MHz to 1910MHz
	RX PCS1900	1930MHz to 1990MHz
ARFCN	E-GSM	Ful(n) = 890 + 0.2 x n at (0 <= n <= 124)
		Ful(n) = 880 + 0.2 x (n-1024) at (975 <= n <= 1023)
		Fdl(n) = Ful(n) + 45
	DCS1800	Ful(n) = 1710.2 + 0.2 x (n-512) at (512 <= n <= 885)
		Fdl(n) = Ful(n) + 95
	PCS1900	Ful(n) = 1850.2 + 0.2 x (n-512) at (512 <= n <= 810)
		Fdl(n) = Ful(n) + 80
RF Local Synthesizer	E-GSM	1279~1314 MHz
	DCS1800	1327~1402 MHz
	PCS1900	1423~1483 MHz
TX IF Frequency	E-GSM	798 MHz (Typ) (880-895 MHz, 900-915 MHz)
		790 MHz (Typ) (895-900 MHz)
	DCS1800	766 MHz (Typ)
	PCS1900	854 MHz (Typ)
Access form		8 channel multiple TDMA
Multiple		8 channel / carrier (E-GSM/DCS1800/PCS1900)
Modulation		270.8333Kbit/s GMSK
Peak output power	E-GSM	2W(33dBm) Class4 MTS
	DCS1800	1W(30dBm) Class1 MTS
	PCS1900	1W(30dBm) Class1 MTS
Nominal supply voltage		+3.8V
TX peak current		2500mA max.
GPRS Class		Class10 (max 1UL/4DL) Operation class B
GPRS Coding scheme		CS1/CS2/CS3/CS4

2. Channel selection conditions

Verify that there is no interference from other radio devices or neighboring measurement systems in the frequencies to be used for the test. If there is interference, select the test channels within the range of the following channels. Especially in case of bit error tests, make sure that there is no influence from outside before the test. If necessary, use a shielded box or take other channel measures.

	E-GSM	DCS1800	PCS1900
Lch	975ch to 980ch	513ch to 523ch	512ch to 522ch
Mch	60ch to 65ch	690ch to 710ch	657ch to 667ch
Hch	120ch to 124ch	874ch to 884ch	800ch to 810ch

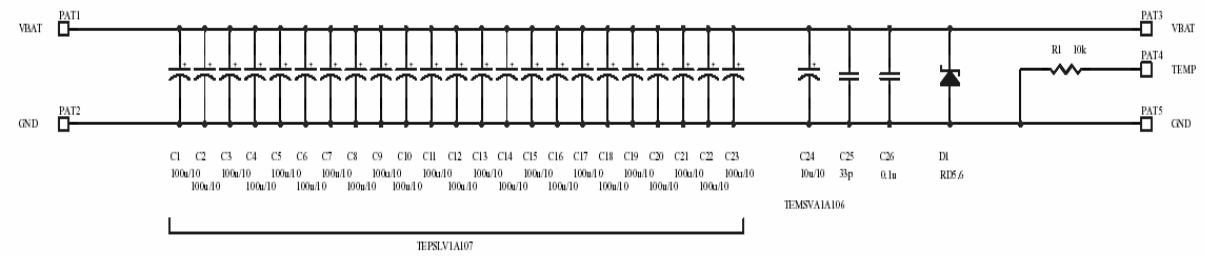
3. Product Specification

Based on GSM 11.10-1 / 3G TS 51.110

4. Measurement adapter

Dummy battery

Dummy battery should be used shown as follows:



Test SIM card

In confidence test, general Phase2 (or Phase2+) test SIM should be used.

RF connector and RF cable

RF connector and RF cable should be used for RF test

PC-Link cable

PC-link cable (Serial Link Cable) should be used.

FUNCTION TEST

1. Test purpose

a) To verify Appearance by visual check

b) To verify recognition of SIM card

c) To verify Function Test in the table shown as below

d) To verify power down phone

2. Test System

1. Power Supply Unit (PSU)+Dummy Baatery or Battery
2. Test SIM Card (Spec: GSM Phase 2+ Test SIM Standard 1(3.1))
3. Sample Hands free Kit (SHF, Stereo)

3. Test Procedure

3.1 Appearance Test

Verify appearance by visual check

3.2 SIM Test

Verify recognition of SIM card
If “Insert SIM” indicated on Display, it is NG.

3.3 Enter Service Mode

3.3.1 No SIM Card installed

a. Power on Phone

b. Press 878 to enter service mode.

3.3.2 SIM Card installed

a. Power on Phone

b. Press #*878# to enter service mode.

3.3.3 Software Version Check

Select item 1 “Service Info” in Service mode to check software version.

3.4 MMI Tests

1. Auto test
2. BT mode
3. Echo loop
4. Version
5. Resource BIN
6. Keypad
7. Vibration
8. Loud spk
9. Ring tone
10. LED
11. LCD
12. Receiver
13. ADC
14. Charger
15. Headset
16. RTC
17. MTBF
18. UART
19. Memory card
20. Nand flash
21. Camera
22. Total call time
23. FM radio

CONFIDENCE TEST

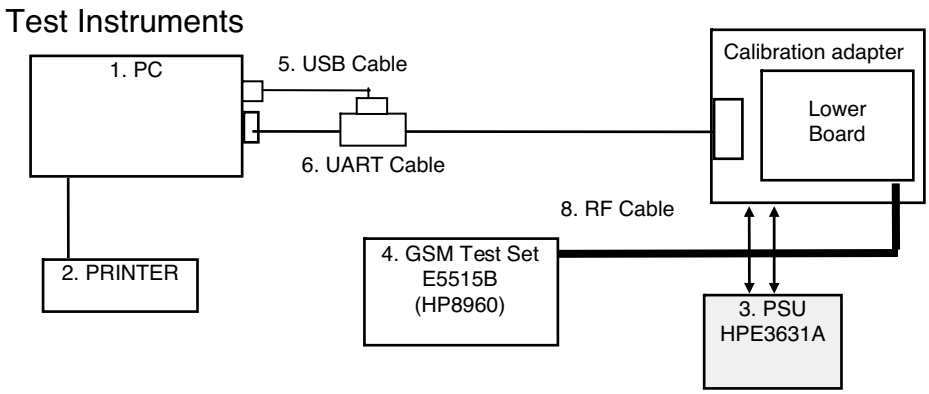
1. Test purpose

This test is for check RF characteristics.

2. Test system

1. PC
2. Printer
3. PSU
4. GSM Test Set
5. USB Cable
6. UART Cable
7. Calibration Adapter
8. RF Cable

Measurement setup is shown as follows:

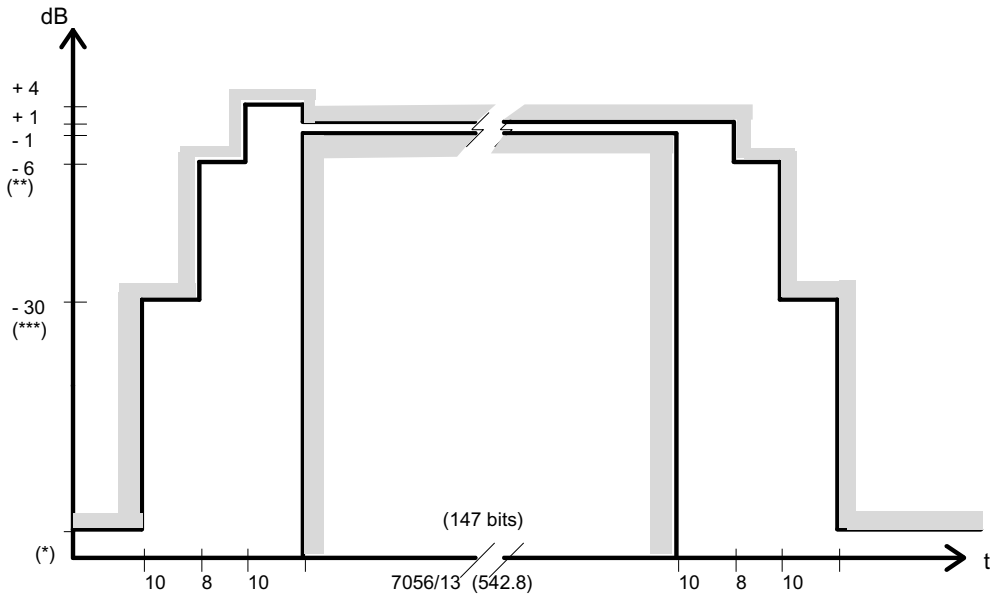


3. Test Specification

Measurement item and specification is defined as follows:

Test Item	Specification		
	E-GSM	DCS1800	PCS1900
TX Maximum Power	33dBm +/-2dB	30dBm +/-2dB	
TX Power	31dBm +/- 3dB @ PL6	28dBm +/- 3dB @ PL1	
	29dBm +/- 3dB @ PL7	26dBm +/- 3dB @ PL2	
	27dBm +/- 3dB @ PL8	24dBm +/- 3dB @ PL3	
	25dBm +/- 3dB @ PL9	22dBm +/- 3dB @ PL4	
	23dBm +/- 3dB @ PL10	20dBm +/- 3dB @ PL5	
	21dBm +/- 3dB @ PL11	18dBm +/- 3dB @ PL6	
	19dBm +/- 3dB @ PL12	16dBm +/- 3dB @ PL7	
	17dBm +/- 3dB @ PL13	14dBm +/- 3dB @ PL8	
	15dBm +/- 3dB @ PL14	12dBm +/- 4dB @ PL9	
	13dBm +/- 3dB @ PL15	10dBm +/- 4dB @ PL10	
	11dBm +/- 5dB @ PL16	8dBm +/- 4dB @ PL11	
	9dBm +/- 5dB @ PL17	6dBm +/- 4dB @ PL12	
	7dBm +/- 5dB @ PL18	4dBm +/- 4dB @ PL13	
	5dBm +/- 5dB @ PL19	2dBm +/- 5dB @ PL14	
		0dBm +/- 5dB @ PL15	
RMS Phase error	<5deg		
PEAK Phase error	<20deg		
Frequency Error	< 90Hz	< 180Hz	< 185Hz
Power Vs Time	pass/fail indication. Detail specification is shown as table 4.1		
RX Class2 RBER	<2.4% @ -103.5dBm (avg 10000bit)		
RX Level	7 +/-4 @ -103.5dBm		
RX Quality	<3 @ -103.5dBm		

Power Vs Time mask specification



Time mask for normal duration bursts(NB,FB,dB and SB) at GMSK modulation

(*)	For GSM 900 MS	: -59 dBc or -54 dBm, whichever is the greater, except for the time slot preceding the active slot, for which the allowed level is -59 dBc or -36 dBm whichever is the greater
	For DCS1800 and PCS1900 MS	: -48 dBc or -48 dBm, whichever is the higher.
(**)	For GSM 900 MS	: -4 dBc for power control level 16; -2 dBc for power level 17; -1 dBc for power level controls levels 18 and 19.
	For DCS1800 and PCS1900 MS	: -4dBc for power control level 11, -2dBc for power level 12, -1dBc for power control levels 13,14 and 15
(***)	For GSM 900 MS	: -30 dBc or -17 dBm, whichever is the higher.
	For DCS1800 and PCS1900 MS	: -30dBc or -20dBm, whichever is the higher.

4. Test Procedure

Test items should be sequential in the table shown as below. Due to limitation of GSM test set, the test should be started under E-GSM mode and hand over to DCS1800. In PCS1900 mode, the test should be started under PCS1900 mode.

Default setting of GSM test set and PSU is shown as follows:

(Internal Loss)	(Please measure cable loss on first set-up and calibrate it.)
CALL STATUS	IDLE
CELL STATUS	ACTIVE CELL
OPERATING MODE	E-GSM
Expected input level	TX Level 5 : 33dBm
Control Base station Broadcast	Broadcast ON
Control Base station Channel	20
Control Base station Amplitude	-85dBm
Mobile Phone Channel	62 (could be changed ARFCN Mch)
Mobile Phone TX Level	5
Mobile Phone Timeslot	4
PSU output voltage	+3.8V +/- 0.05V
PSU maximum current limit	2500mA

CALL STATUS	IDLE
CELL STATUS	ACTIVE CELL
OPERATING MODE	PCS1900
Expected input level	TX Level 0 : 30dBm
Control Base station Broadcast	Broadcast ON
Control Base station Channel	512
Control Base station Amplitude	-85dBm
Mobile Phone Channel	661 (could be changed ARFCN Mch)
Mobile Phone TX Level	0
Mobile Phone Timeslot	4
PSU output voltage	+3.8V +/- 0.05V
PSU maximum current limit	2800mA

Test item	MODE	Procedure
Start up	E-GSM	1. Set SIM card and dummy battery to HHP 2. Power on HHP 3. Wait to indicate “GSM Test Net 001”
Call setup	E-GSM	1. Input the PTE command “StartCall” 2. Input the PTE command “Receivecall”. 3. Wait to indicate “Active” to establish call
TX Power	E-GSM DCS1800	1. ARFCN is assign to Mch (and Lch/Hch) 2. Set PL to 5(E-GSM) or 0(DCS1800) 3. Wait to establish hand over 4. Measure output power
RMS Phase error	E-GSM DCS1800	1. ARFCN is assigned to Mch (or Lch/Hch) 2. Set PL to 5(E-GSM) or 0(DCS1800) 3. Wait to establish hand over 4. Change mode of GSM tester to “Phase/FREQ” 5. Set analyze burst number to 50 6. Read “RMS maximum” window
PEAK Phase error	E-GSM DCS1800	1. ARFCN is assigned to Mch (or Lch/Hch) 2. Set PL to 5(E-GSM) or 0(DCS1800) 3. Wait to establish hand over 4. Change mode of GSM tester to “Phase/FREQ” 5. Set analyze burst number to 50 6. Read “PEAK maximum” window
Frequency Error	E-GSM DCS1800	1. ARFCN is assigned to Mch (or Lch/Hch) 2. Set PL to 5(E-GSM) or 0(DCS1800) 3. Wait to establish hand over 4. Change mode of GSM tester to “Phase/FREQ” 5. Set analyze burst number to 50 6. Read “Frequency error maximum” window
Power Vs Time	E-GSM DCS1800	1. ARFCN is assigned to Mch 2. Set PL to 5(E-GSM) or 0(DCS1800) 3. Wait to establish hand over 4. Change mode of GSM tester to “Power Ramp” 5. To check pass/fail indication under three mode “TOP 2dB” “Rise edge” and “Fall edge”
RX Class2 RBER	E-GSM DCS1800	1. ARFCN is assigned to Mch*1 2. Set PL to 5(E-GSM) or 0(DCS1800) 3. Wait to establish hand over 4. Change mode of GSM tester to “Bit error” 5. To define sampling value to 10000 6. To define measure “Res Type 2” 7. To adjust base station output level to -103.5dBm 8. Wait to indicate BE Ratio and read it.
RX Level	E-GSM DCS1800	1. Same setting and procedure as RX RBER 2. Wait to indicate “Mobile reported Rxlev” and read it.
RX Quality	E-GSM DCS1800	1. Same setting and procedure as RX RBER 2. Wait to indicate “Mobile reported RX Qual” and read it.
Hand over	E-GSM to DCS1800	1. Change mode of GSM tester to “DUAL BAND” 2. To define DCS1800 parameter. ARFCN to Mch, Base station output level to -85dBm, Mobile power level to PL0. 3. Push “Execute” and check establish hand over.

***1 Refer to 1.Overview Channel selection condition**

Test item	MODE	Procedure
Close down	DCS1800	(Test is repeated under DCS1800 band) 1. Push “END Call” of GSM tester 2. Wait to indicate “Call End” and change to idle screen. 3. Push “Power” to check shut down.
Band Change	E-GSM / DCS1800->PCS1900	1. Change mode of GSM tester to “PCS1900”. 2. Set HHP to PCS1900 mode using PTE Command UsePTEcommand 00140 => SetBandSelect,1
Call setup	PCS1900	1. Input the PTE command “StartCall” 2. input the PTE command “Receivecall” 3. Wait to indicate “Active” to establish call
TX Power	PCS1900	1. ARFCN is assign to Mch (or Lch/Hch) 2. Set PL to 0(PCS1900) 3. Wait to establish hand over 4. Measure output power
RMS Phase error	PCS1900	1. ARFCN is assigned to Mch (or Lch/Hch) 2. Set PL to 0(PCS1900) 3. Wait to establish hand over 4. Change mode of GSM tester to “Phase/FREQ” 5. Set analyze burst number to 50 6. Read “RMS maximum” window
PEAK Phase error	PCS1900	1. ARFCN is assigned to Mch (or Lch/Hch) 2. Set PL to 0(PCS1900) 3. Wait to establish hand over 4. Change mode of GSM tester to “Phase/FREQ” 5. Set analyze burst number to 50 6. Read “PEAK maximum” window
Frequency Error	PCS1900	1. ARFCN is assigned to Mch (or Lch/Hch) 2. Set PL to 0(PCS1900) 3. Wait to establish hand over 4. Change mode of GSM tester to “Phase/FREQ” 5. Set analyze burst number to 50 6. Read “Frequency error maximum” window
Power Vs Time	PCS1900	1. ARFCN is assigned to Mch 2. Set PL to 0(PCS1900) 3. Wait to establish hand over 4. Change mode of GSM tester to “Power Ramp” 5. To check pass/fail indication under three mode “TOP 2dB” “Rise edge” and “Fall edge”
RX Class2 RBER	PCS1900	1. ARFCN is assigned to Mch*1 2. Set PL to 0(PCS1900) 3. Wait to establish hand over 4. Change mode of GSM tester to “Bit error” 5. To define sampling value to 10000 6. To define measure “Res Type 2” 7. To adjust base station output level to -103.5dBm 8. Wait to indicate BE Ratio and read it.
RX Level	PCS1900	1. Same setting and procedure as RX RBER 2. Wait to indicate “Mobile reported Rxlev” and read it.
RX Quality	PCS1900	1. Same setting and procedure as RX RBER 2. Wait to indicate “Mobile reported RX Qual” and read it.
Close down	PCS1900	1. Push “END Call” of GSM tester 2. Wait to indicate “Call End” and change to idle screen. 3. Push “Power” to check shut down.

***1 Refer to 1.Overview Channel selection condition**

3. Test Specification

Measurement item and specification is shown as below :

Test item	MODE	Specification
TX Maximum Power	E-GSM	+24dBm ~ +43dBm

Test item	MODE	Specification
Current Value		Max 100£ìA
USB I/F Check		Detection of HHP COM port

4. Test Procedure

Test items should be sequential in the table shown as below :

Test item	MODE	Procedure
Start up	E-GSM	1. Set dummy battery to HHP 2. Link cable is connected (auto power ON) 3. Put Into test mode
TX Power	E-GSM	1. ARFCN is assign to Mch 2. Set PL to 5(E-GSM) 3. Measure output power
Current Check		1. Input following PTE command. Use PTE Command, <Magic Number> ContTx off Backlight off Key Backlight off SelectBacklight off 2. Check current value
USB I/F Check		1. Check detection of HHP COM port *1

5. BackUp Battery Check

BackUp Battery Check must performed after FT process

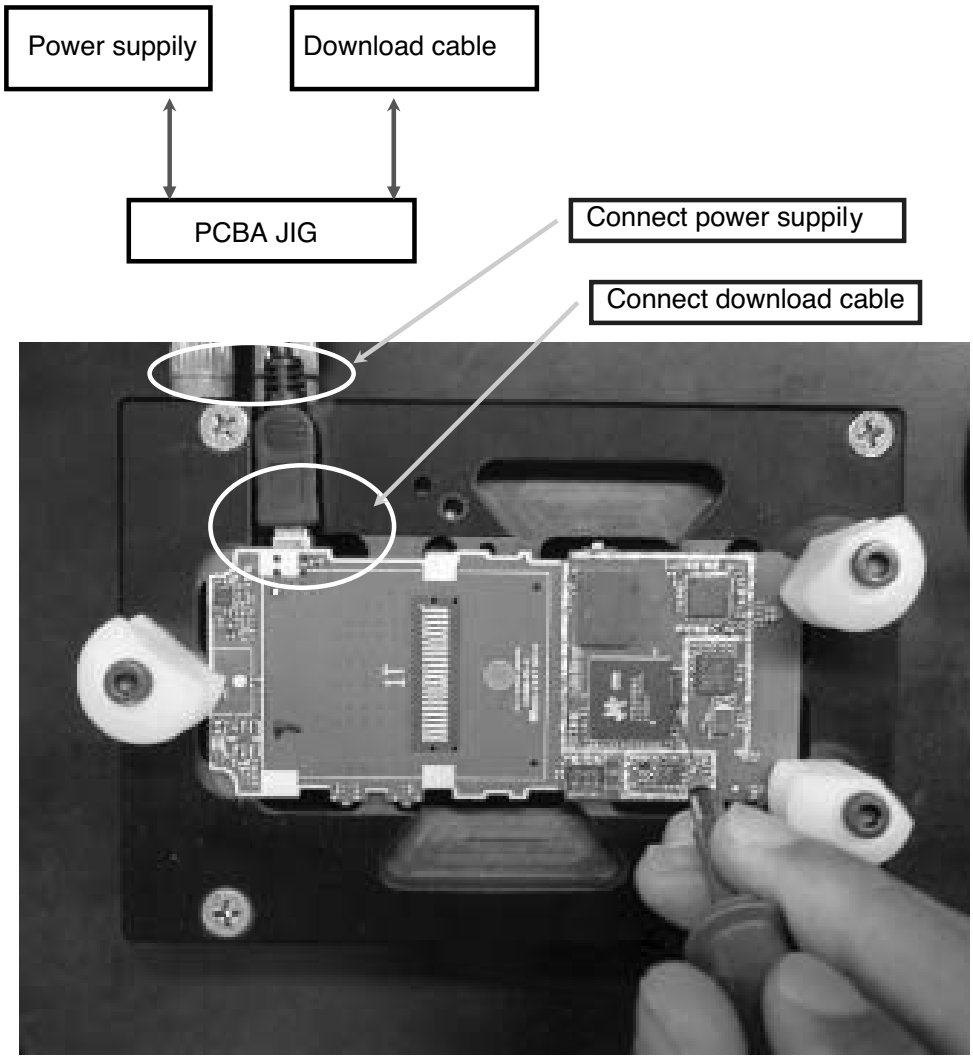
Back Up Battery Check process is shown as follows :

1. RTC time is automatically set up at FT process(2004/01/01 00:00)
2. Check the RTC time next process

ITEM	DETAIL	PTE command	Specification
Check RTC time	Check the RTC clock register value	HexPeek,700CC008,3,1	Min05a39a80(HEX) Max05a4ec00(HEX) (24hour)

Note : Stingray's BackUp Battery will become empty in 2.5 days. BackUpBattery test must be performed within two days after soldering VIB FPC.

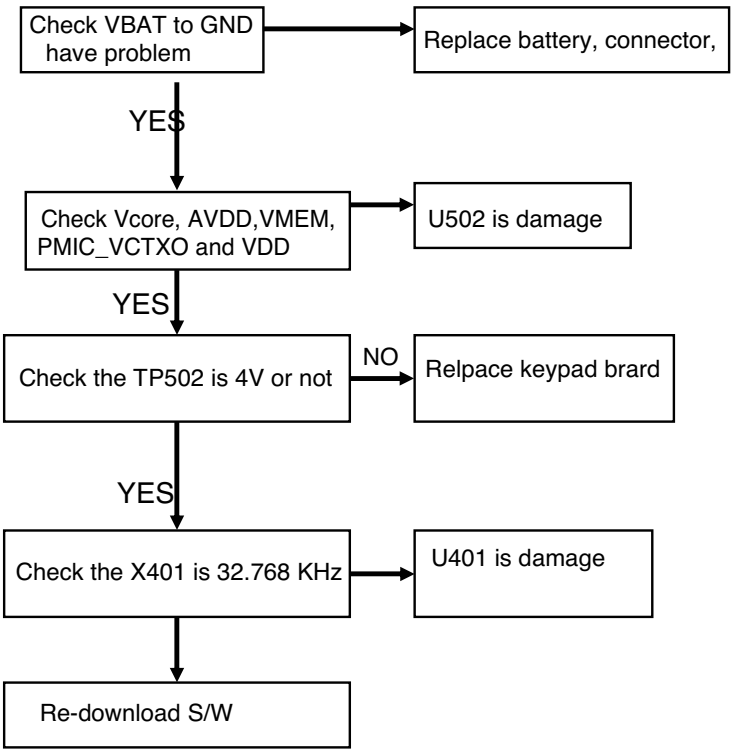
How to use repair jig



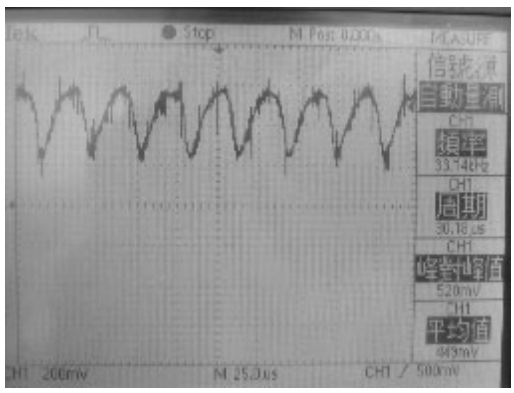
6.2 TROUBLE SHOOTING

MAIN BOARD SECTION

1. Can not power on

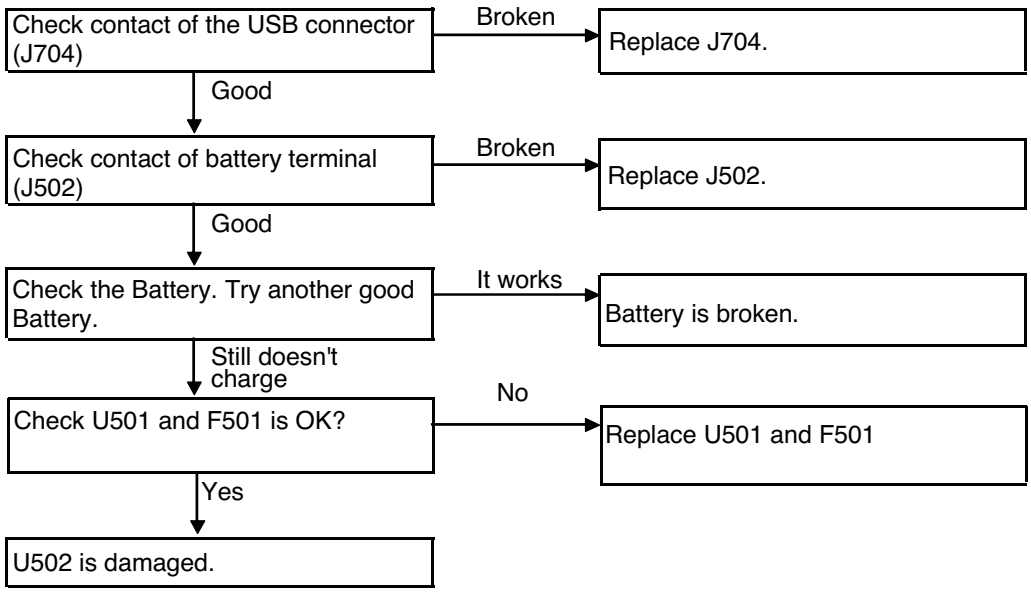


Vcore	C508	1.8V
AVDD	C510	2.8V
VMEM	C512	2.8V
PMIC_VCTXO	C511	2.8V
VDD	C509	2.8V

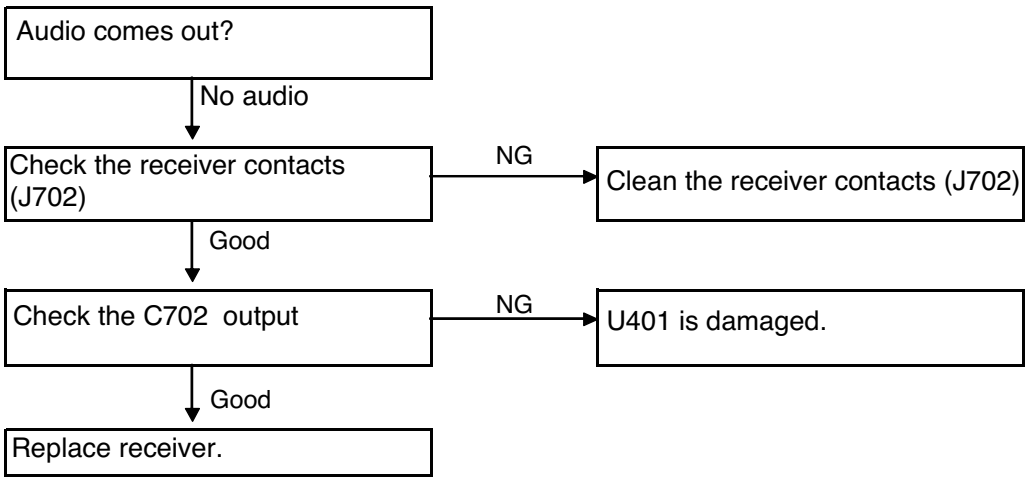


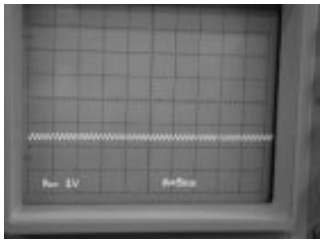
X401: 32KHz

2. Can not charge battery



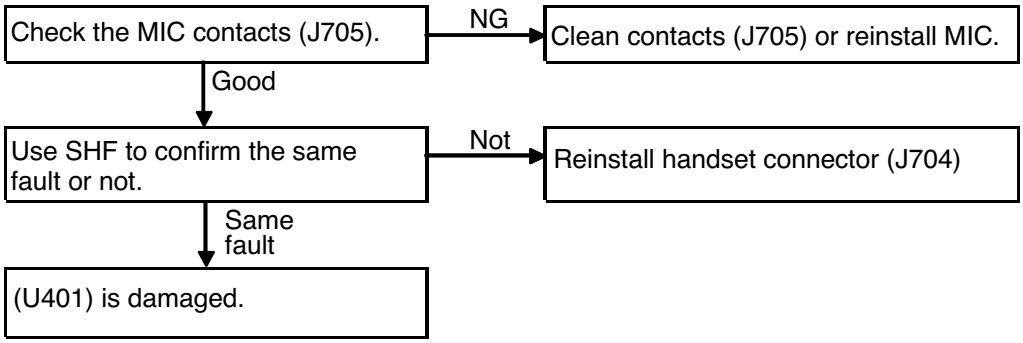
3. No or Low audio (receiver)

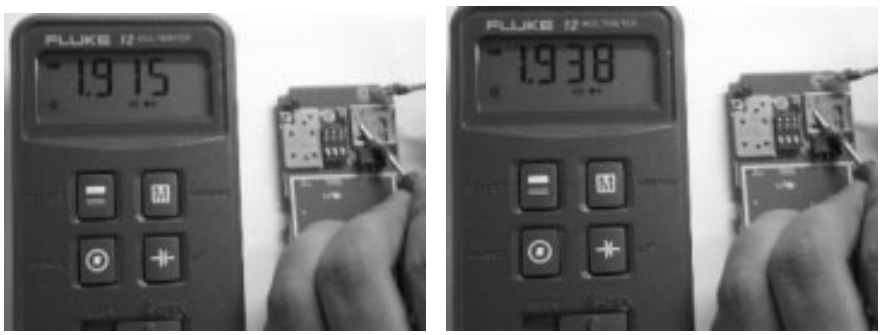




C702 Outputy

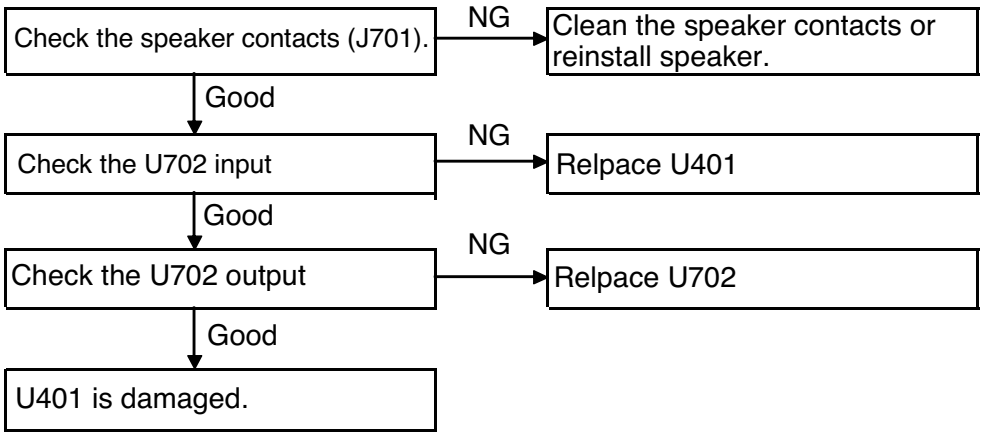
4. No MIC

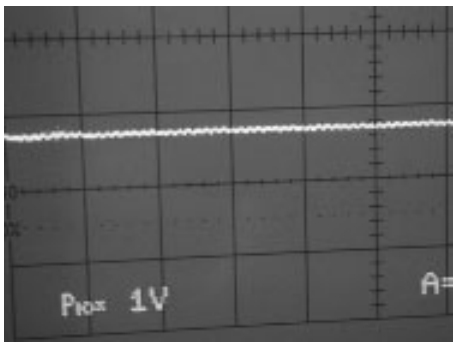




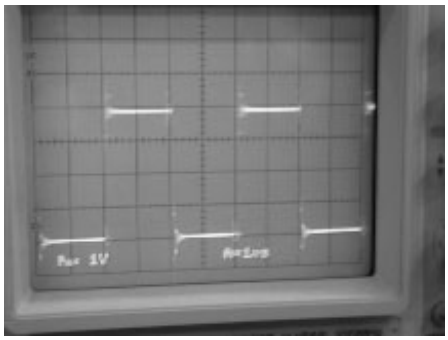
J705 output

5. NO speaker



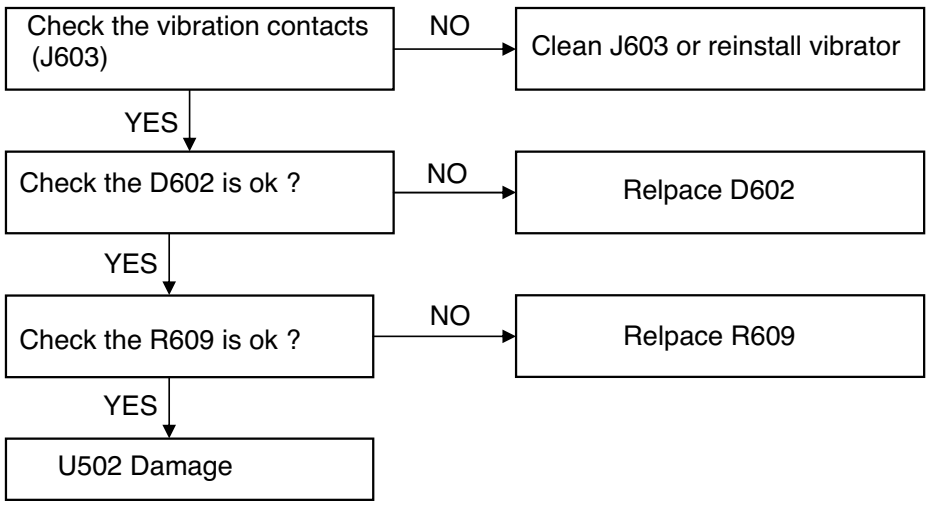


U702 input

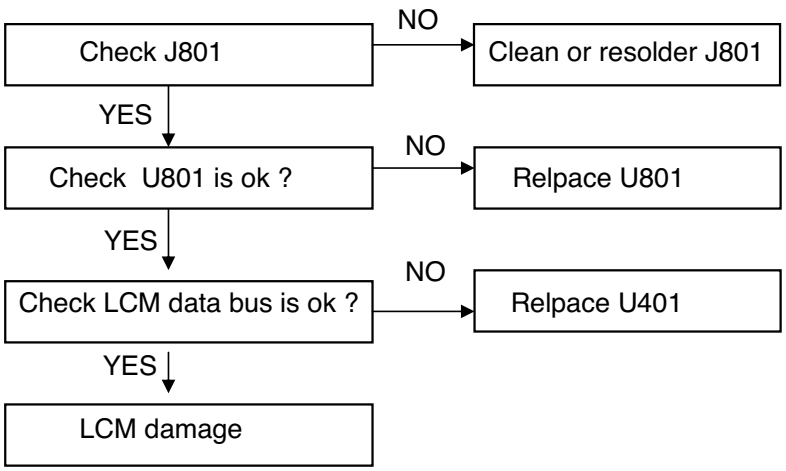


U702 output

6. Vibration



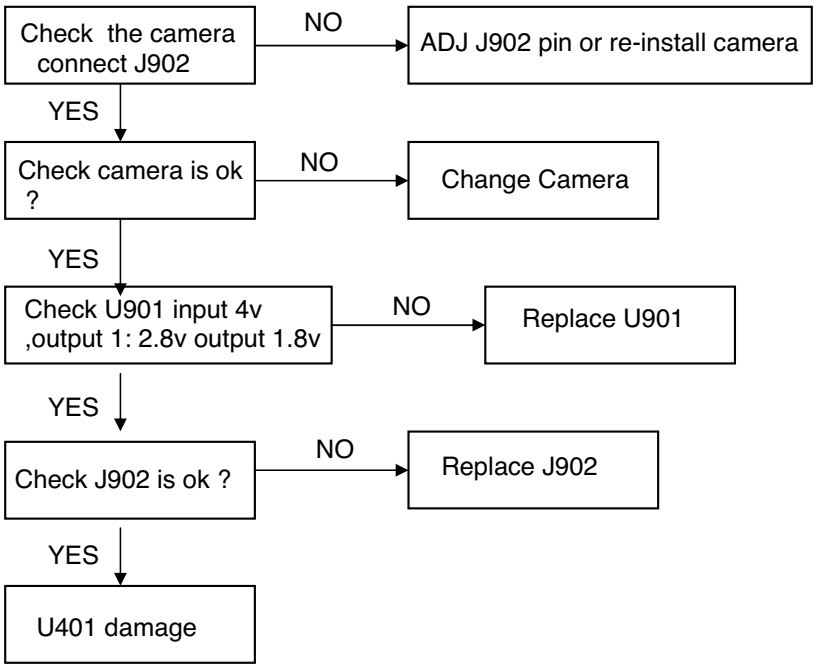
7. LCD



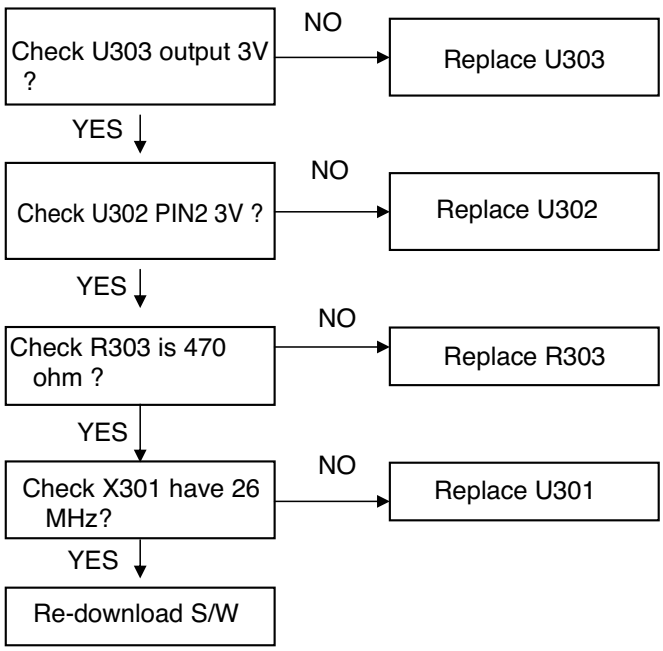
Check LCM data bus

pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	20	22
	1.1	X	0.8	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	X	X	1.7	0.8	0	0

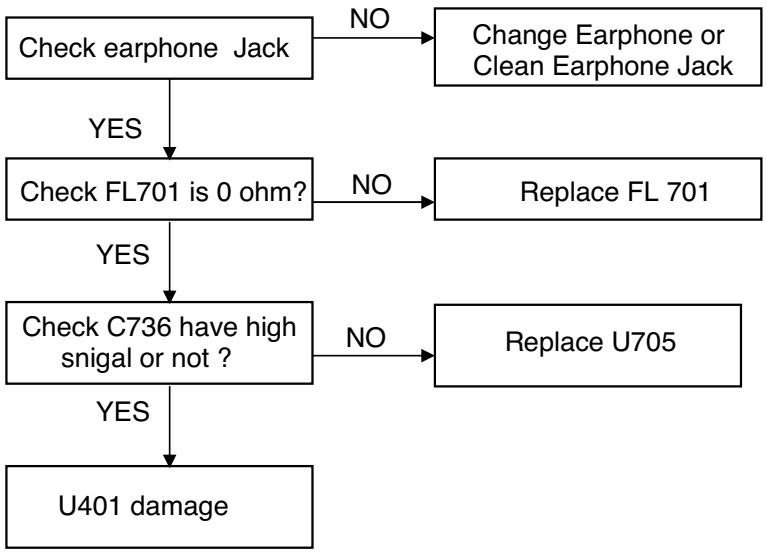
8. Camera



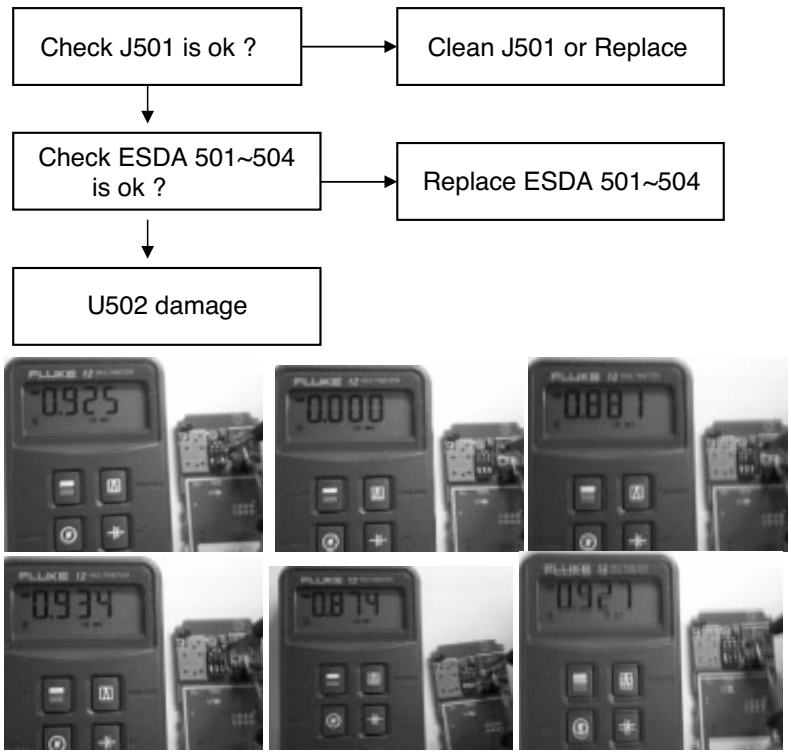
9. Bluetooth



10. Earphone

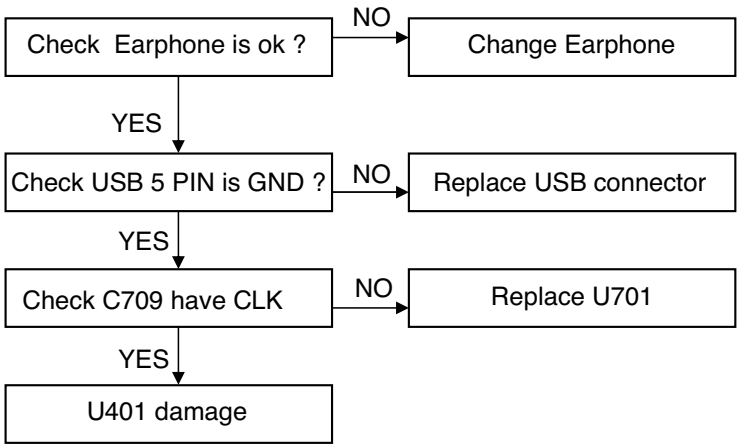


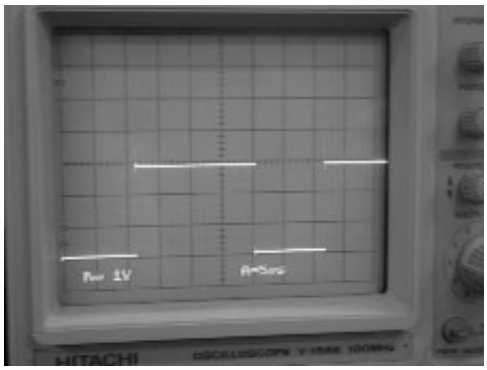
11.SIM card



Check ESD 501~504

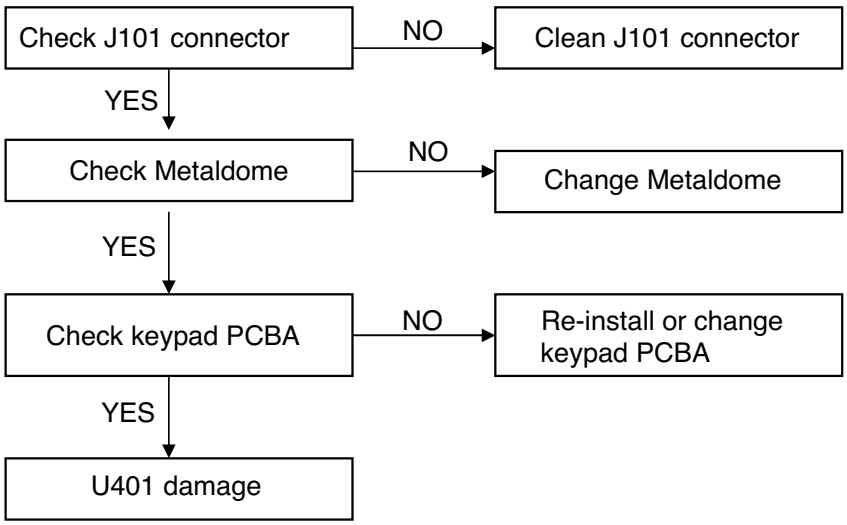
12. FM (radio)



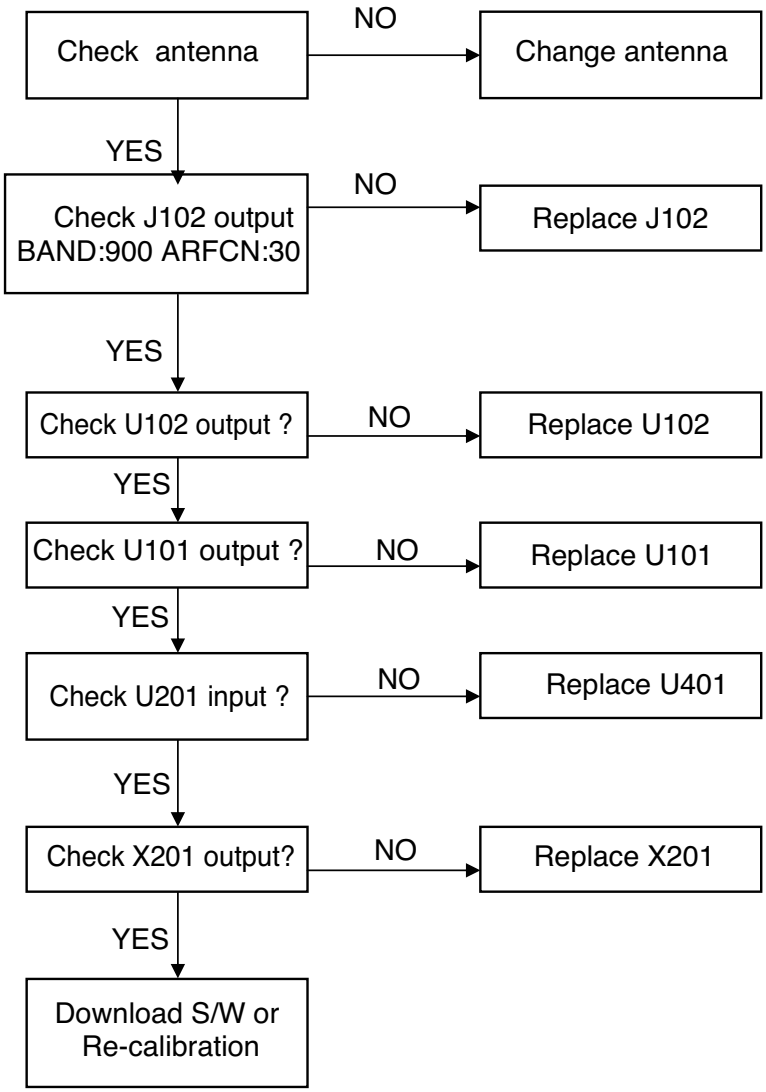


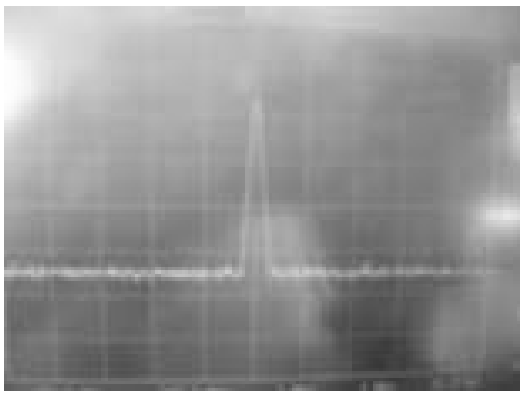
C709 CLK

13. Keypad

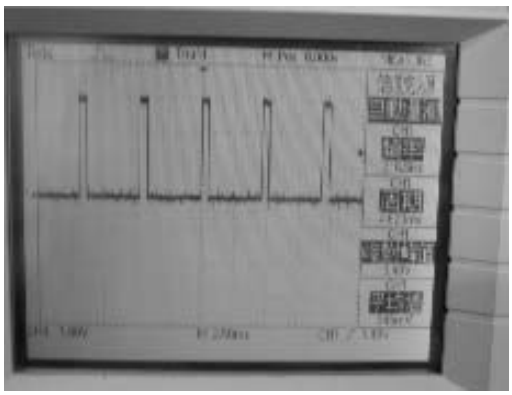


14. RF

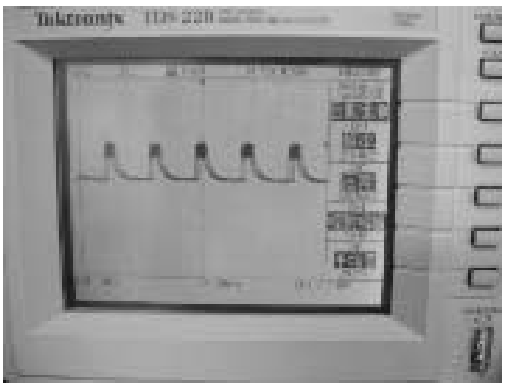




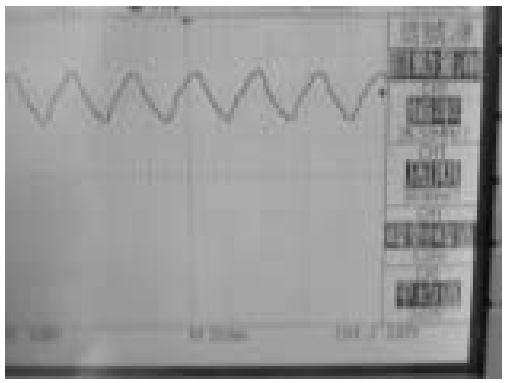
J201 Output



U102,U101,U201 output



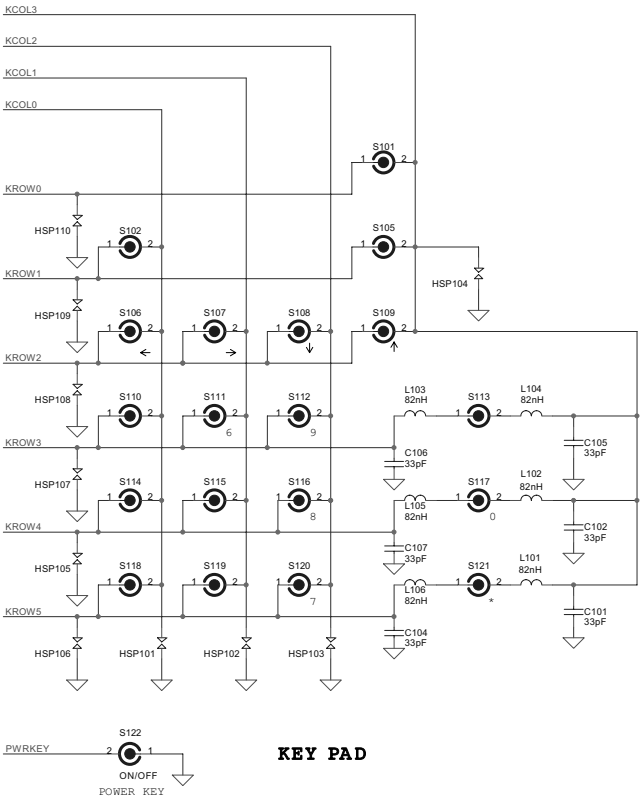
U201 input

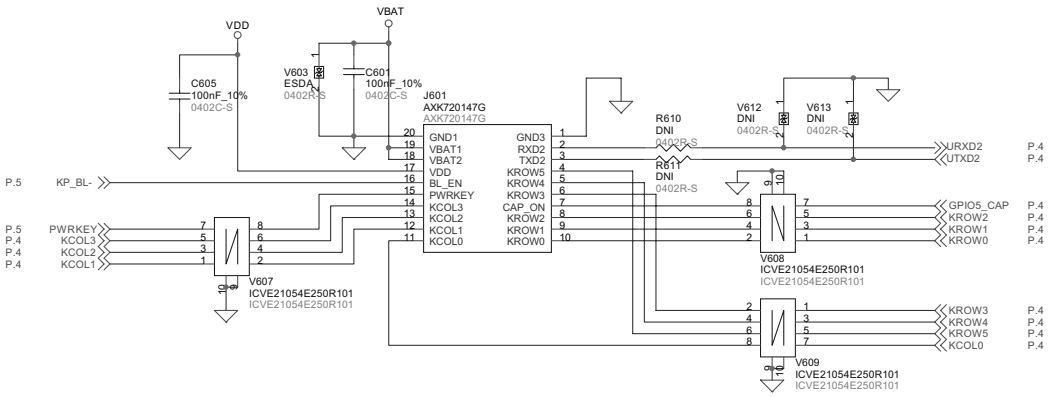


X201 output

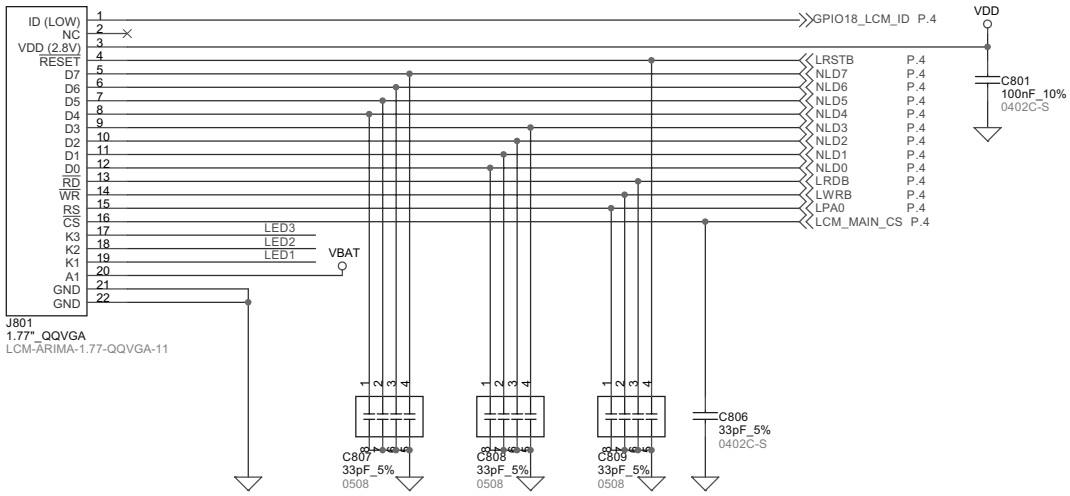
6.3 Circuit Diagrams

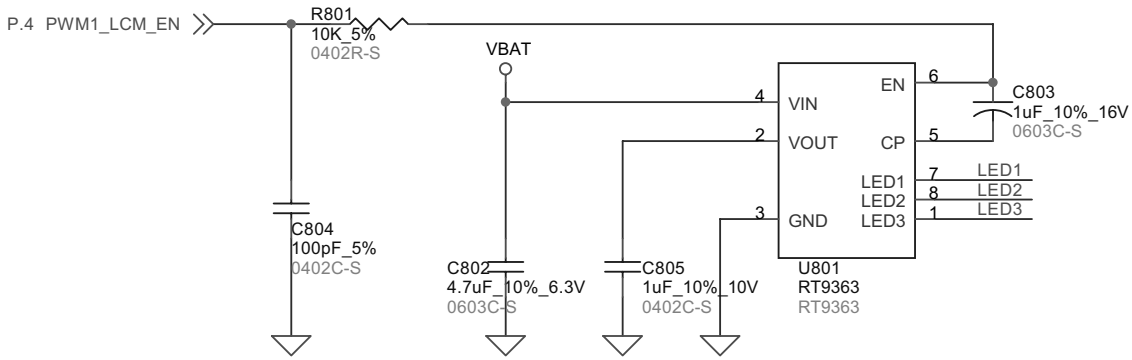
Keypad Switches and Key Backlight Illumination





LCM Backlight Circuit

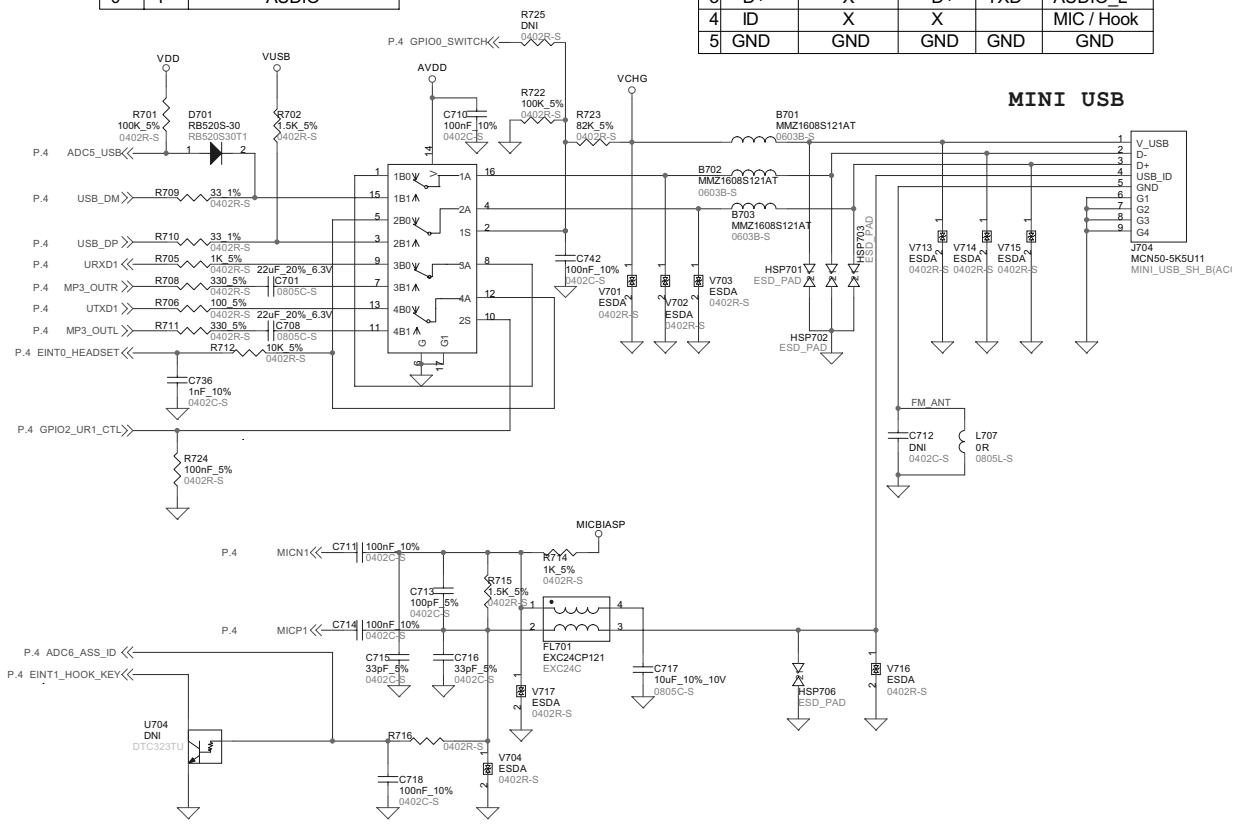




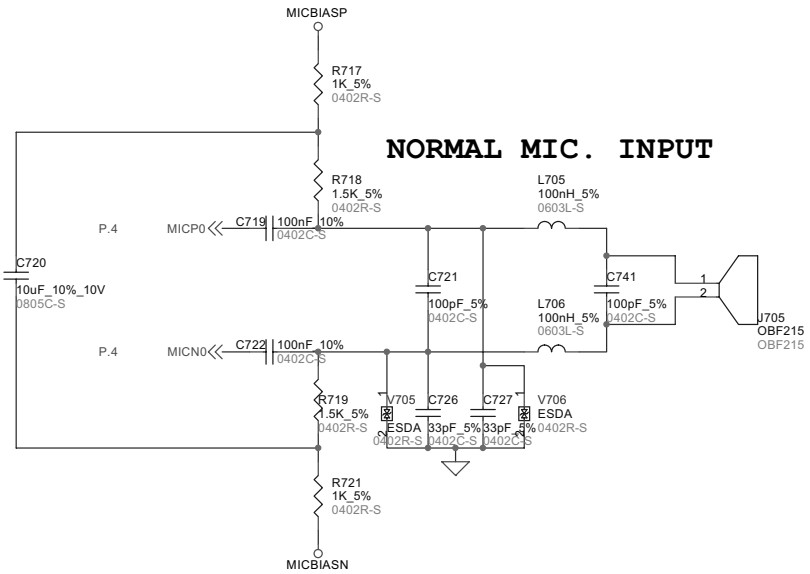
Earphone Jack

FSA2467 Function Select		
1S	2S	Function Mode
1	X	USB
0	0	UART
0	1	AUDIO

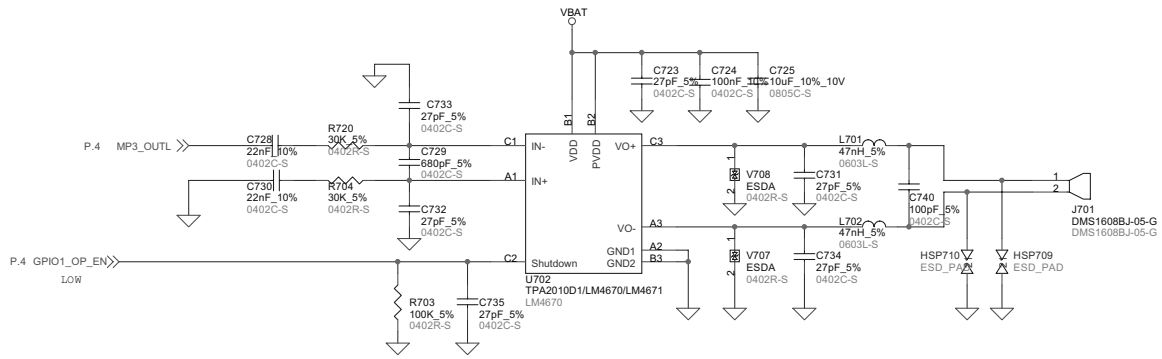
Accessory PIN Define					
		Charger	USB	UART	Hands-free
1	V_USB	Charger_in	V_USB	X	X
2	D-	X	D-	RXD	AUDIO_R
3	D+	X	D+	TXD	AUDIO_L
4	ID	X	X		MIC / Hook
5	GND	GND	GND	GND	GND



Microphone

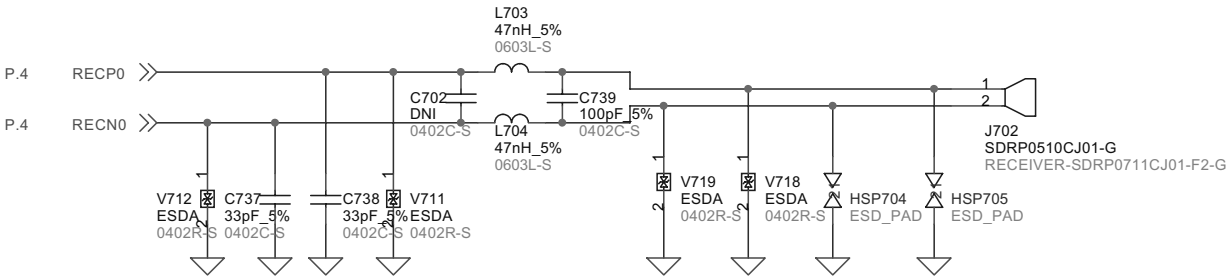


Speaker

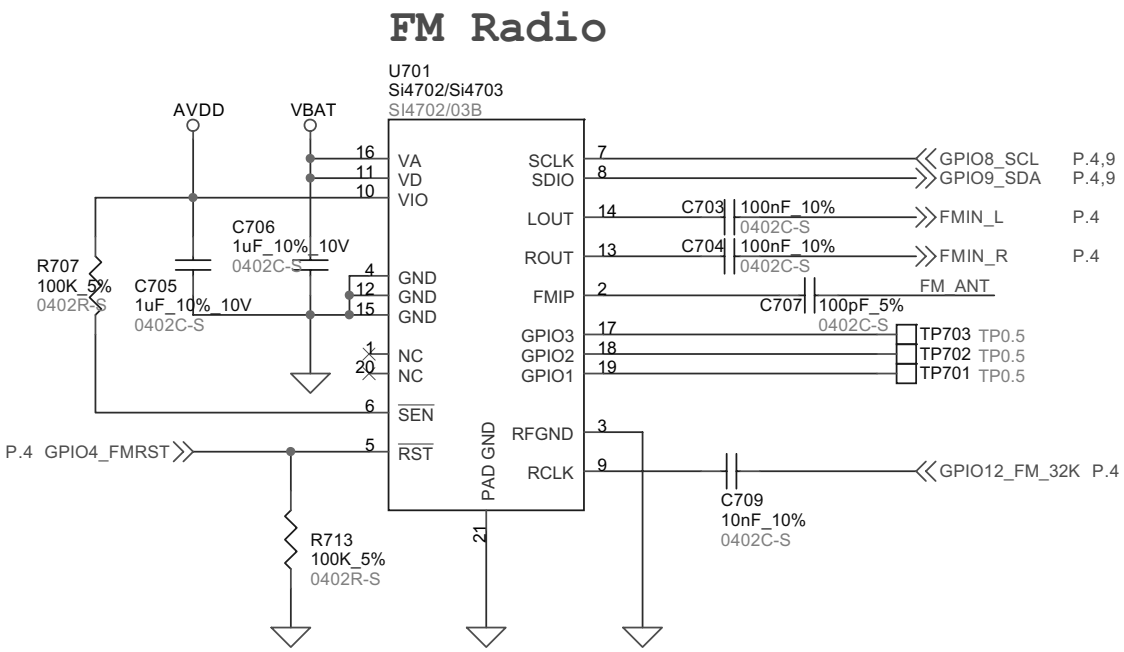


SPEAKER AMPLIFIER

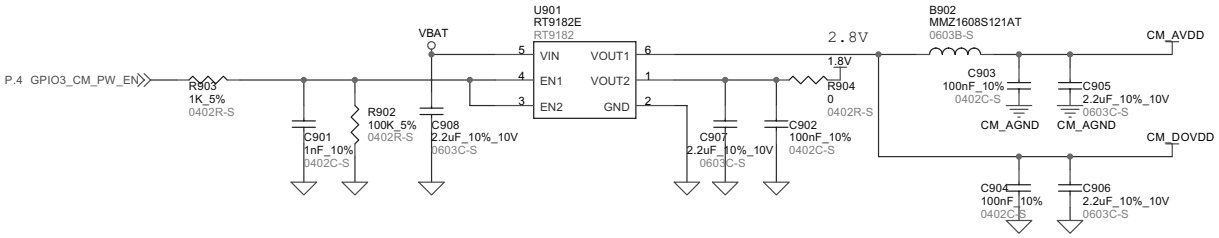
Receiver

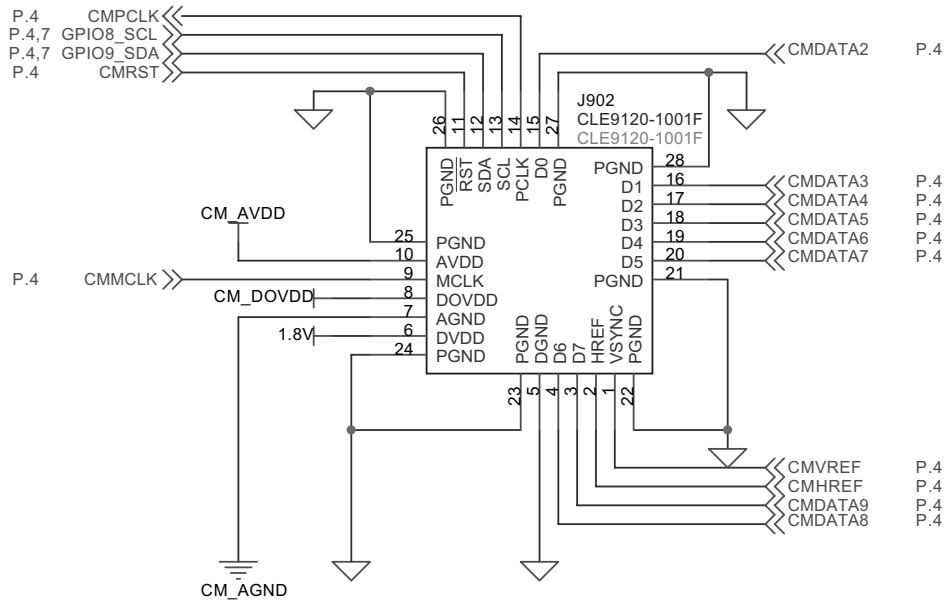


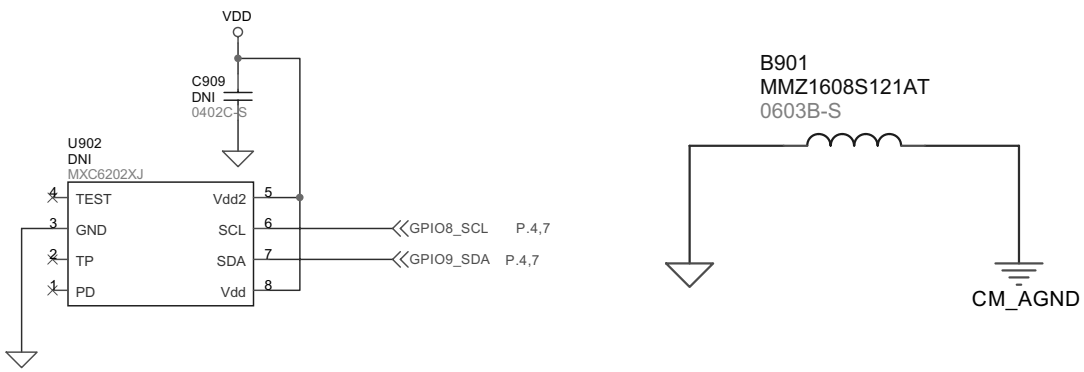
FM Receiver



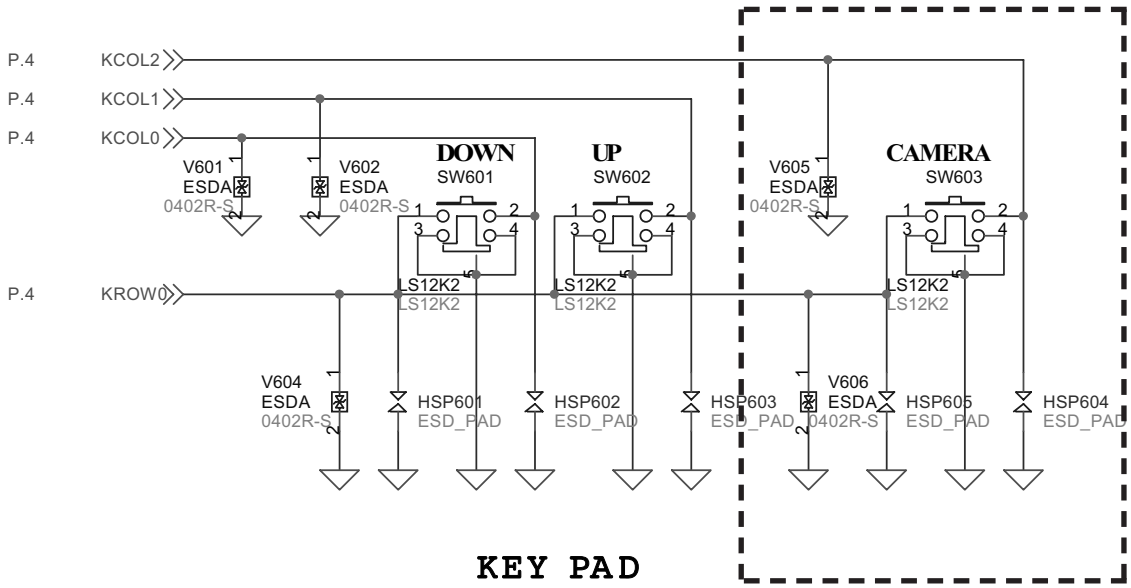
Camera Module



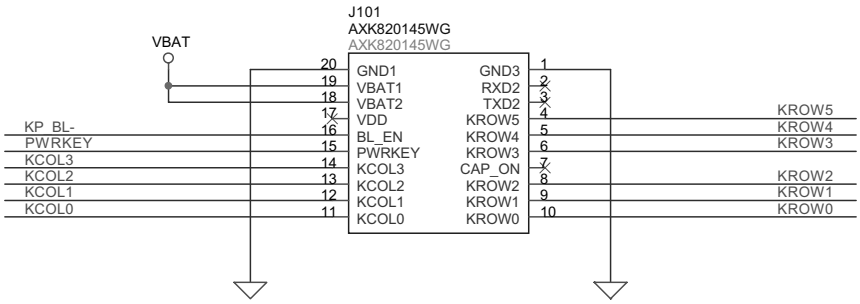


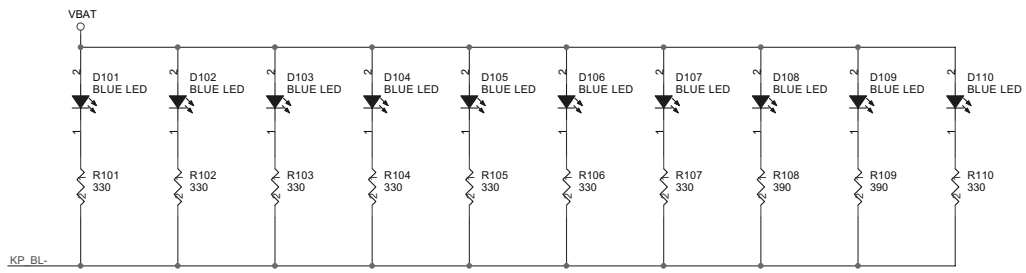


Side Key Switch



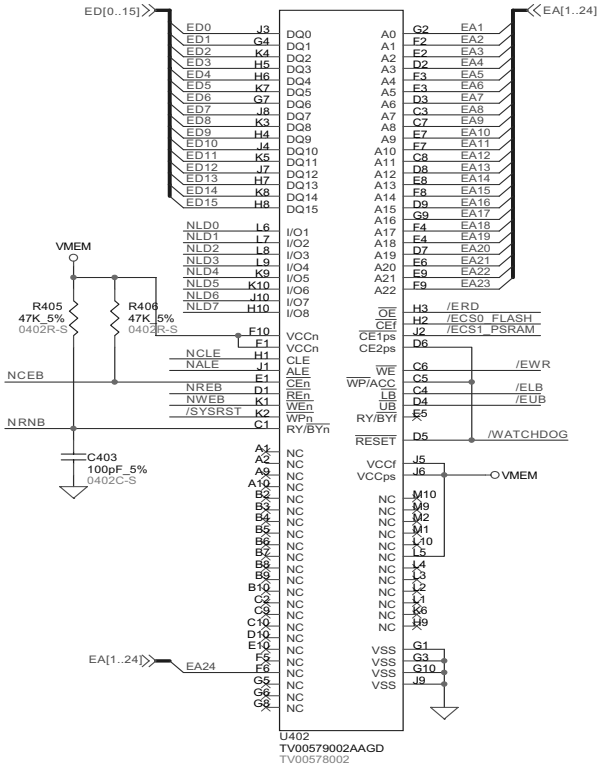
Keypad Backlight Illumination and Status LED



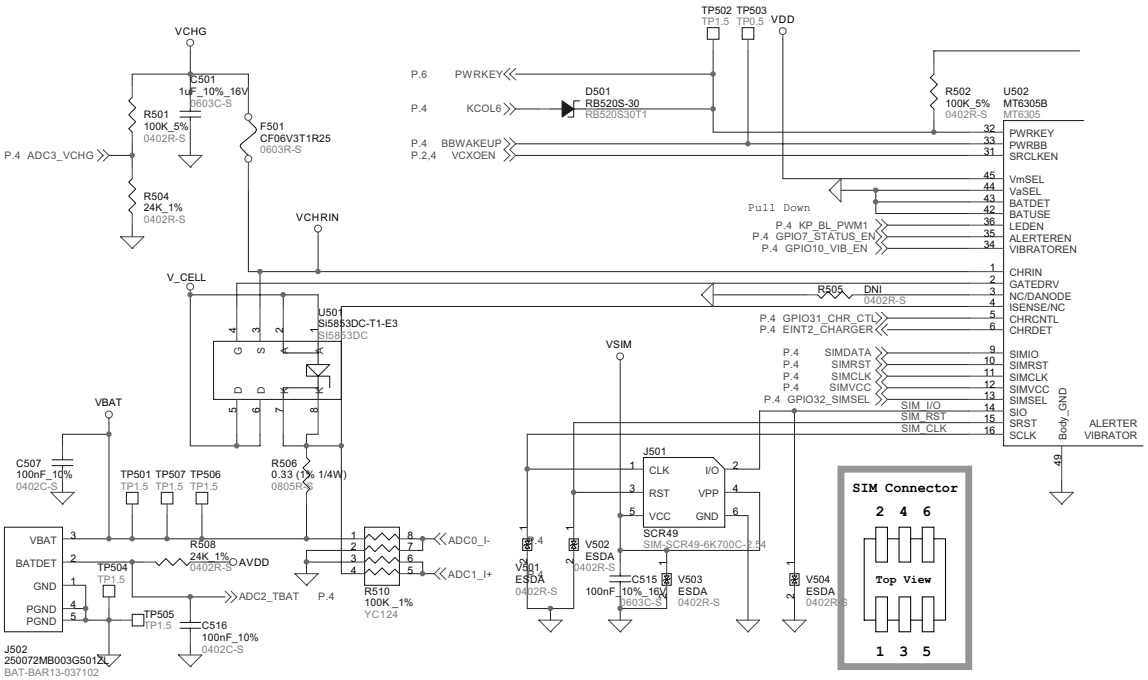


LED

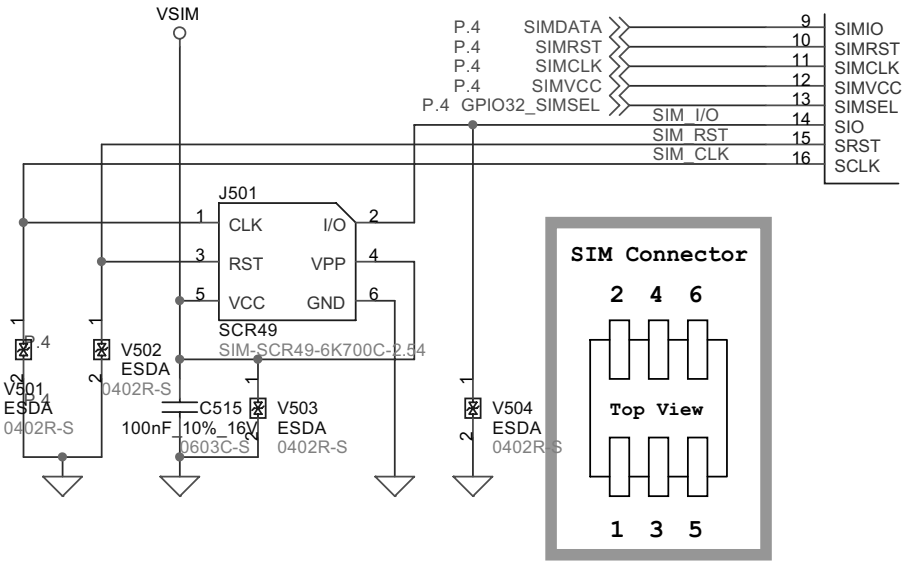
Memory



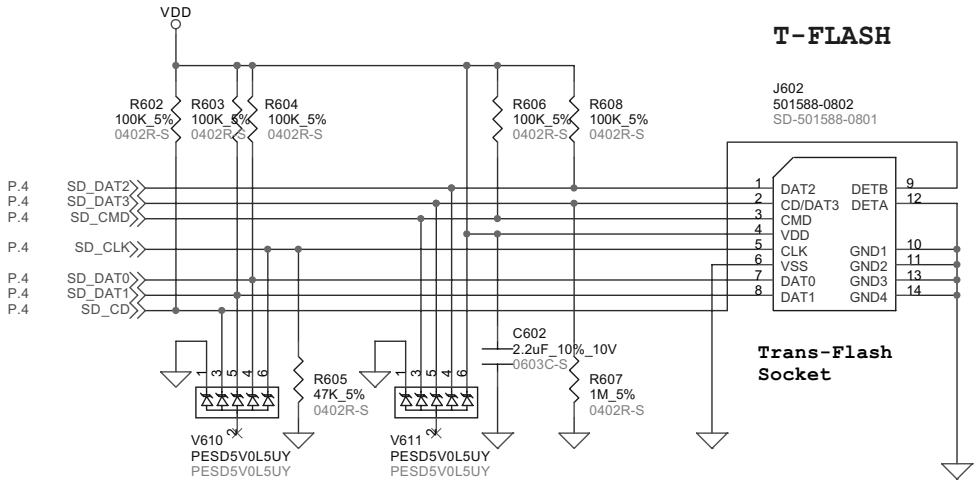
Charger



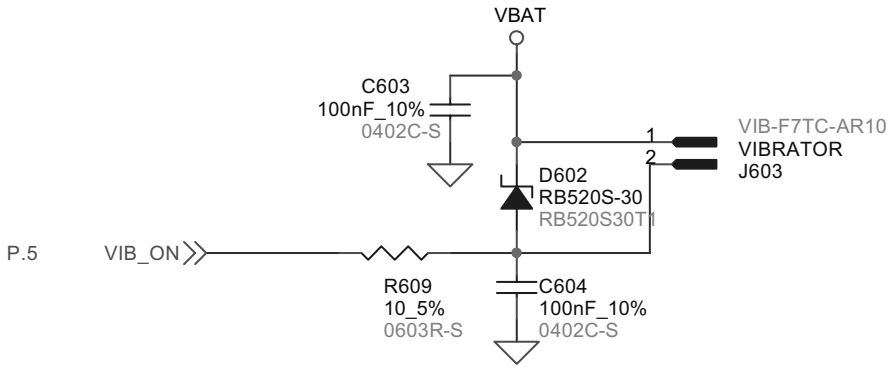
SIM card



SD card

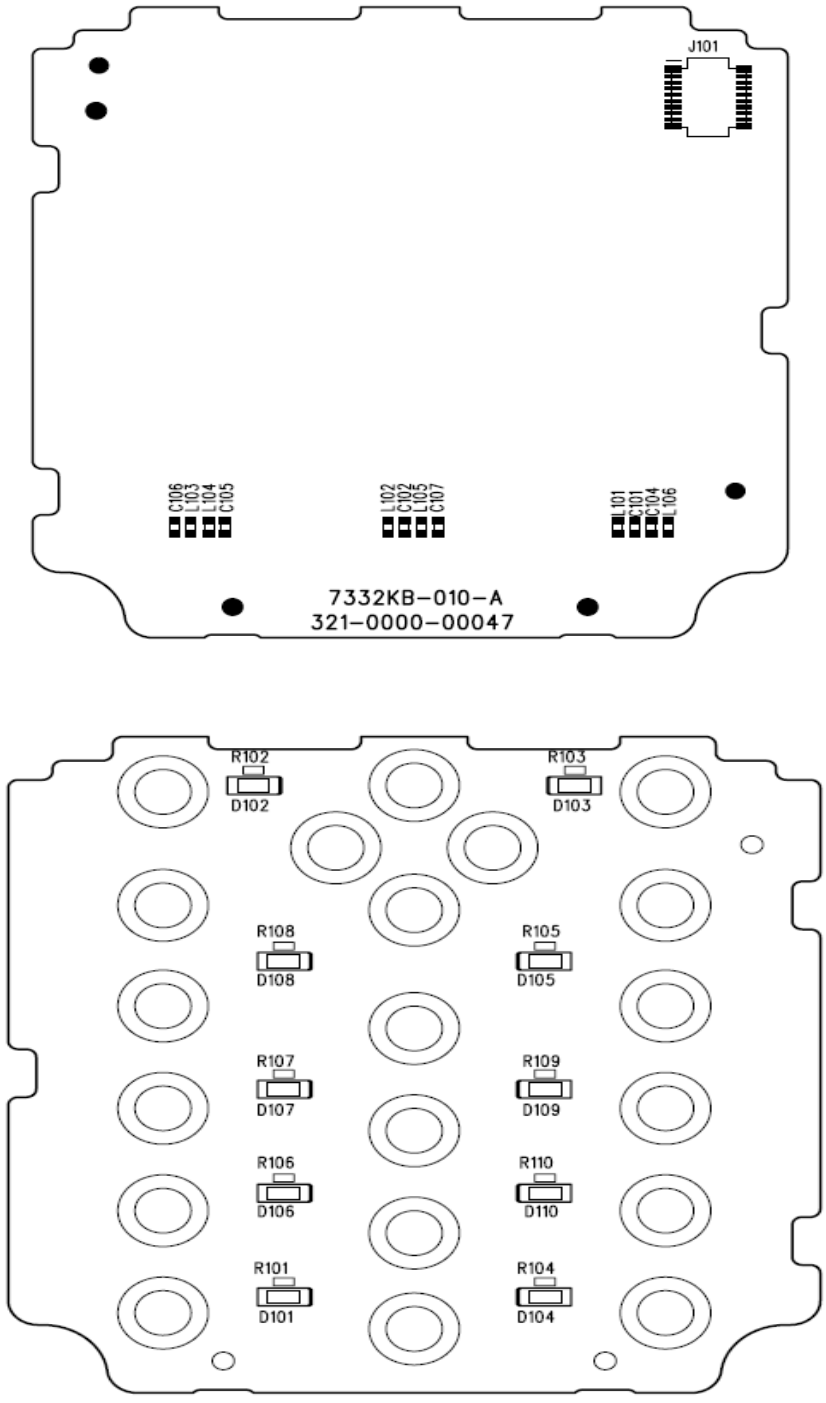


Vibrator

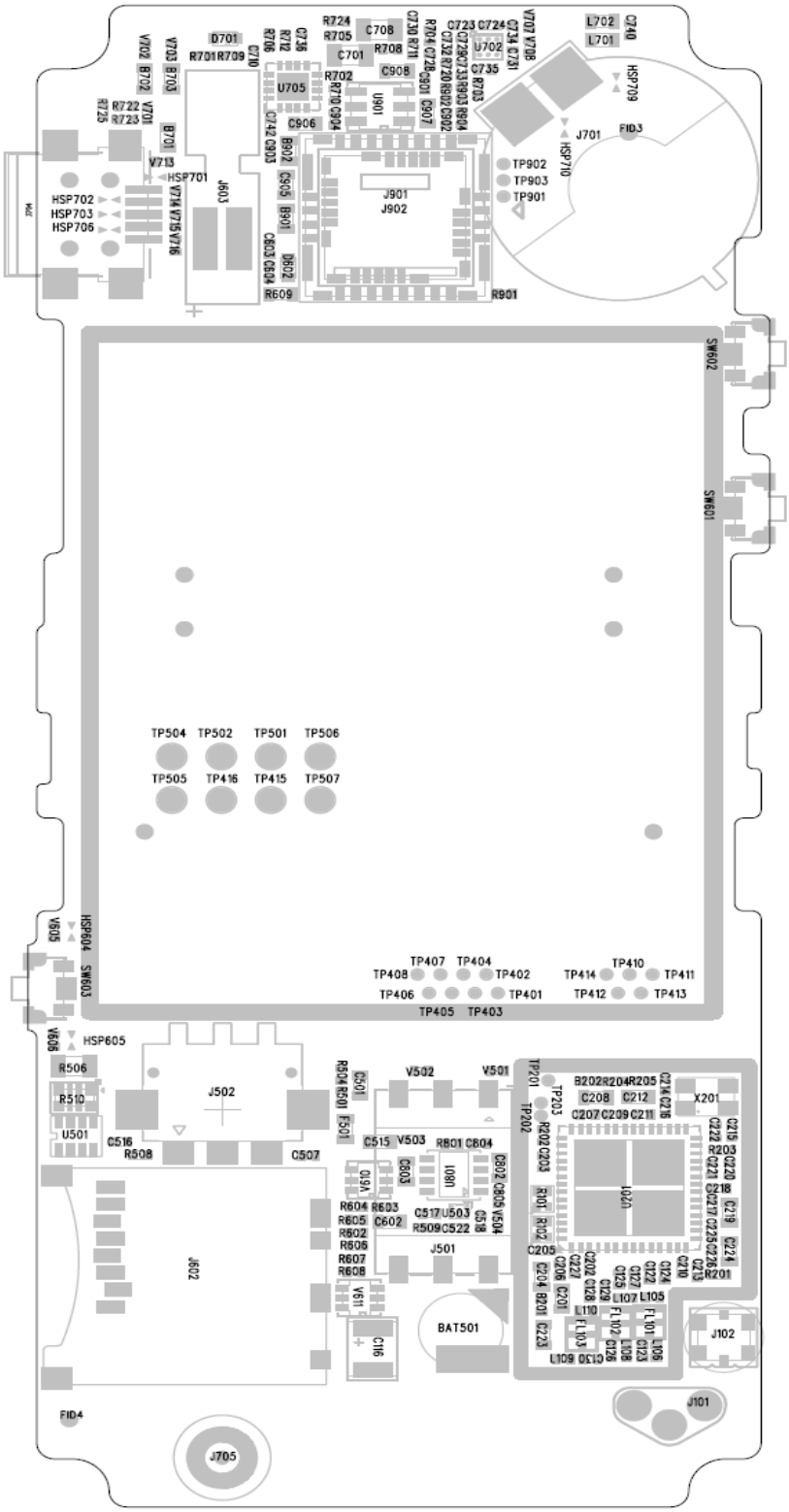


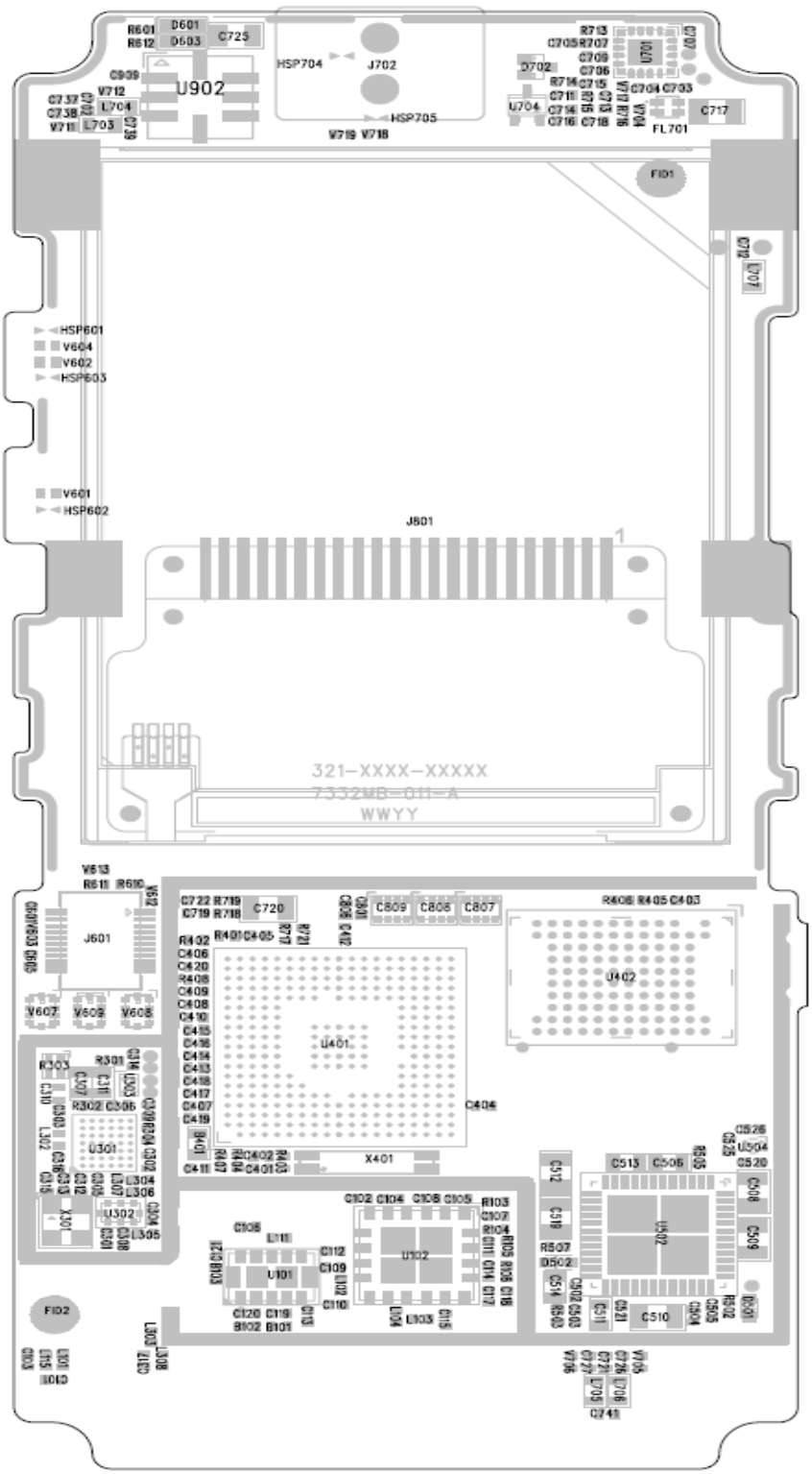
Component place information

Key pad board



Main board





Section 7

Device Information

7. Device Information

DSC (DIGITAL STATIC CAMERA) MODULE

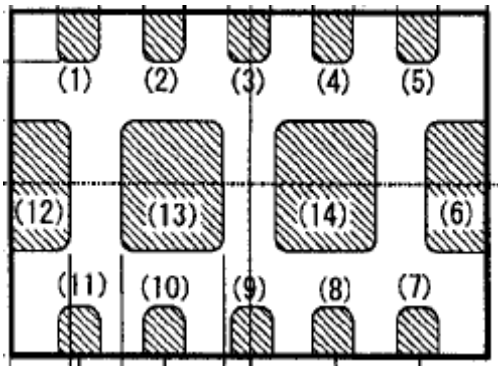
Pin List

Pin Number	Name	Pin Type	Function/Description
1	VSYNC	Output	Vertical sync output
2	HREF	Output	HREF output
3	Y7	Output	YUV video component output bit[7]
4	Y6	Output	YUV video component output bit[6]
5	GND	Power	Power ground
6	DVDD	Power	Digital power supply (+1.8VDC±10%)
7	GND	Power	Power ground
8	DOVDD	Power	I/O Power Supply (+2.45 to 3.0 VDC)
9	MCLK	Input	Crystal clock input (Default 24MHz)
10	AVDD	Power	Analog power supply (+2.45 to 3.0VDC)
11	RESET	Function (default = 1)	Clears all registers and resets them to their default values.
12	SDA	I/O	Serial interface data I/O
13	SCL	Input	Serial interface clock input
14	PCLK	Output	Pixel clock output
15	Y0	Output	YUV video component output bit[0]
16	Y1	Output	YUV video component output bit[1]
17	Y2	Output	YUV video component output bit[2]
18	Y3	Output	YUV video component output bit[3]
19	Y4	Output	YUV video component output bit[4]
20	Y5	Output	YUV video component output bit[5]

7. Device Information

FRONT END MODULE (TX/RX SWITCH)

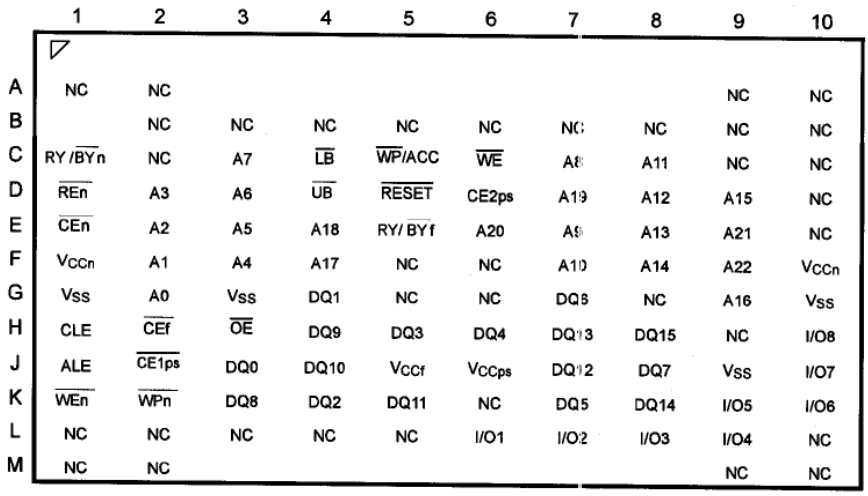
1. Pin List



(1)	DCS_RX	(8)	GND
(2)	VC3	(9)	ANT
(3)	PCS_RX	(10)	VC1
(4)	VC2	(11)	GSM(850/900)-RX
(5)	DCS/PCS_TX	(12)	GND
(6)	GND	(13)	GND
(7)	GSM(850/900)_TX	(14)	GND

FLASH MEMORY

1. PIN ASSIGNMENT (TOP VIEW)



	1	2	3	4	5	6	7	8	9	10
A	NC	NC							NC	NC
B		NC	NC	NC	NC	NC	NC	NC	NC	NC
C	RY /$\overline{BY}$n	NC	A7	$\overline{LB}$	$\overline{WP}$/ACC	$\overline{WE}$	A8	A11	NC	NC
D	$\overline{REn}$	A3	A6	$\overline{UB}$	$\overline{RESET}$	CE2ps	A19	A12	A15	NC
E	$\overline{CEn}$	A2	A5	A18	RY/ $\overline{BY}$f	A20	A9	A13	A21	NC
F	V_{CCn}	A1	A4	A17	NC	NC	A10	A14	A22	V_{CCn}
G	V_{SS}	A0	V_{SS}	DQ1	NC	NC	DQ8	NC	A16	V_{SS}
H	CLE	$\overline{CEf}$	$\overline{OE}$	DQ9	DQ3	DQ4	DQ11	DQ15	NC	I/O8
J	ALE	$\overline{CE1ps}$	DQ0	DQ10	V_{CCf}	V_{CCps}	DQ12	DQ7	V_{SS}	I/O7
K	$\overline{WEn}$	$\overline{WPn}$	DQ8	DQ2	DQ11	NC	DQ5	DQ14	I/O5	I/O6
L	NC	NC	NC	NC	NC	I/O1	I/O2	I/O3	I/O4	NC
M	NC	NC							NC	NC

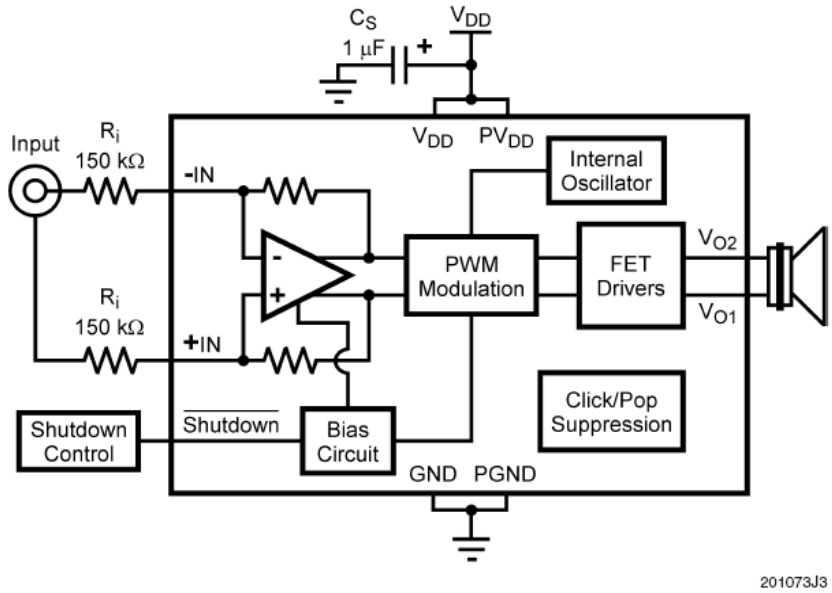
2. Pin List

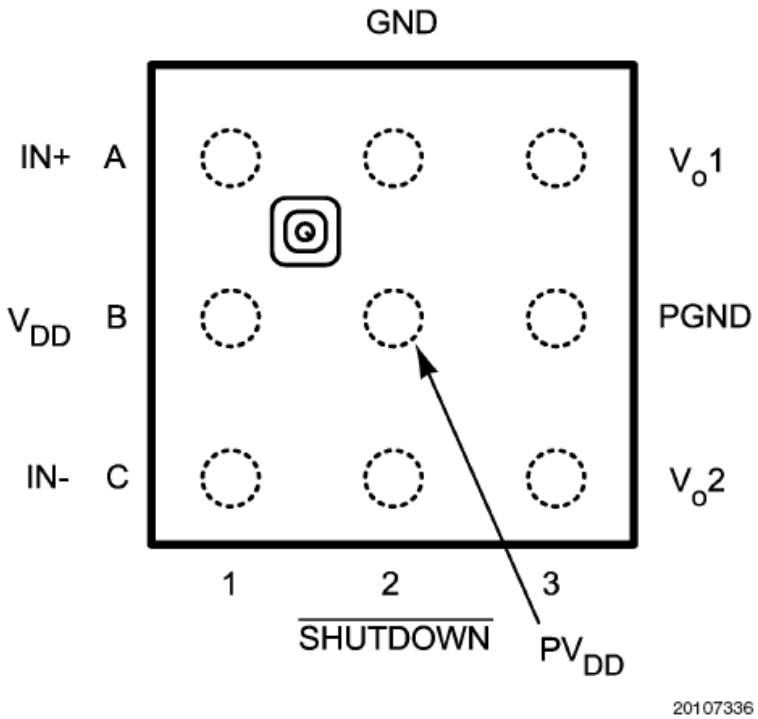
PIN NAMES

A0 to A22	Address inputs for Pseudo SRAM & Nor Flash Memory
DQ0 to DQ15	Data inputs / outputs for Pseudo SRAM & Nor Flash Memory
I/O1 to I/O8	Data inputs / outputs for Nand E²PROM
$\overline{CE1ps}$, CE2ps	Chip enable inputs for Pseudo SRAM
$\overline{CEf}$	Chip enable inputs for Nor Flash Memory
$\overline{CEn}$	Chip enable inputs for Nand E²PROM
$\overline{OE}$	Output enable input for Pseudo SRAM & Nor Flash Memory
$\overline{WE}$	Write enable input for Pseudo SRAM & Nor Flash Memory
$\overline{REn}$	Read enable input for Nand E²PROM
$\overline{WEn}$	Write enable input for Nand E²PROM
$\overline{LB}$, $\overline{UB}$	Data byte control input for Pseudo SRAM
CLE	Command latch enable input for Nand E²PROM
ALE	Address latch enable input for Nand E²PROM
$\overline{WP}$/ACC	Write protect/program acceleration input for Nor Flash Memory
$\overline{WPn}$	Write protect input for Nand E²PROM
$\overline{RESET}$	Hardware reset input for Nor Flash Memory
RY/$\overline{BY}$f	Ready/Busy output for Nor Flash Memory
RY/$\overline{BY}$n	Ready/Busy output for Nand E²PROM
V_{CCps}	Power supply for Pseudo SRAM
V_{CCf}	Power supply for Nor Flash Memory
V_{CCn}	Power supply for Nand E²PROM
V_{SS}	Ground
NC	Not connected

MELODY IC

1. Function Block





POWER AMP MODULE (PA)

1. Function Block

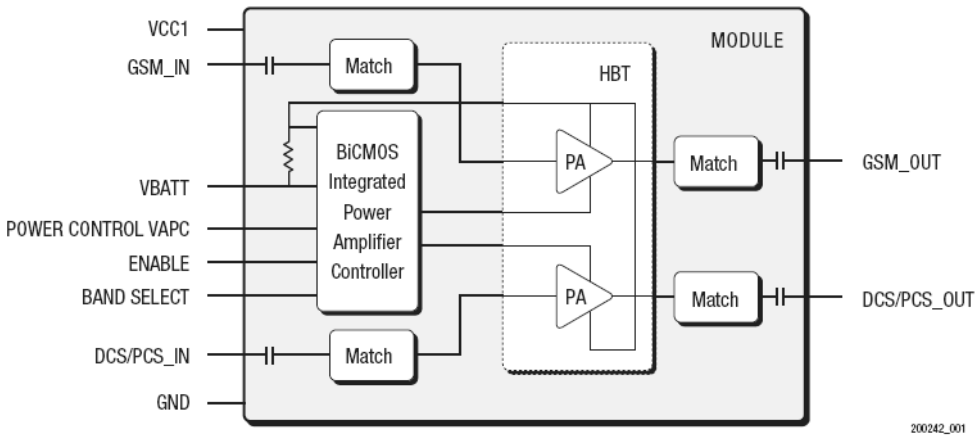


Figure 1. Functional Block Diagram

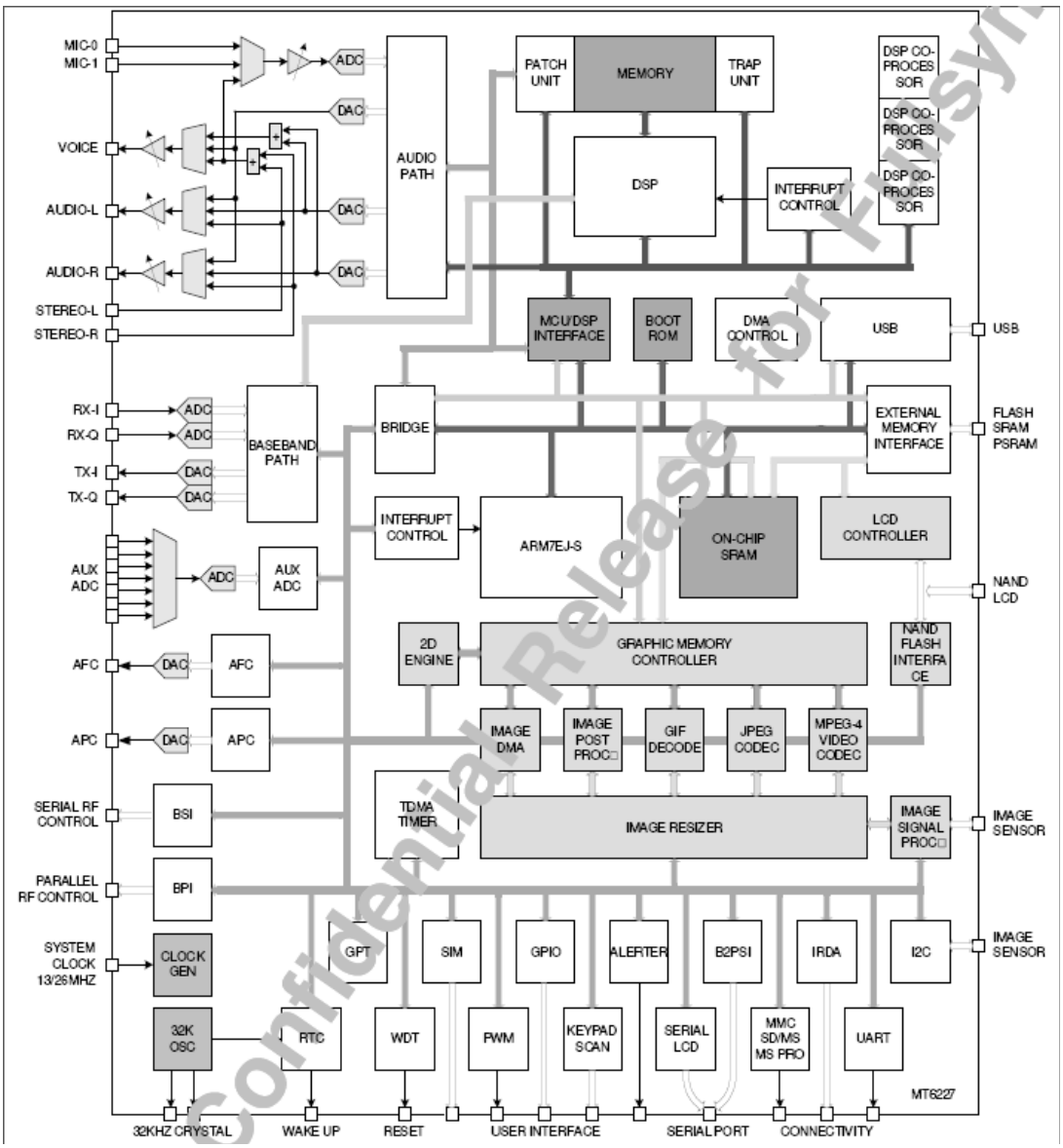
2. Pin List

Pin	Name	Description
1	BS	Band Select
2	VCC1A	VCC (to GSM 1st stage, DCS/PCS 1st stages, BiCMOS PAC)
3	DCS/PCS_IN	RF input 1710-1910 MHz (DCS1800, PCS1900)
4	GSM_IN	RF input 880-915 MHz (GSM)
5	GND	RF and DC Ground
6	VCC1B	VCC (to GSM 2nd stage, DCS/PCS 2nd stages)
7	GND	RF and DC Ground
8	GND	RF and DC Ground
9	GND	RF and DC Ground
10	GND	RF and DC Ground
11	GSM_OUT	RF Output 880-915 MHz (GSM)
12	GND	RF and DC Ground
13	GND	RF and DC Ground
14	GND	RF and DC Ground
15	DCS/PCS_OUT	RF Output 1710-1910 (DCS1800, PCS1900)
16	GND	RF and DC Ground
17	VBATT	Battery input to high side of intermal sense resistor
18	ENABLE	BiCMOS Enable
19	RSVD(GND)	RF and DC Ground
20	VAPC	Power Control Bias Voltage
GND PAD	GND	Ground Pad, device underside

7. Device Information

CPU

1. Fu tion Blo nc ck



2. Pin List

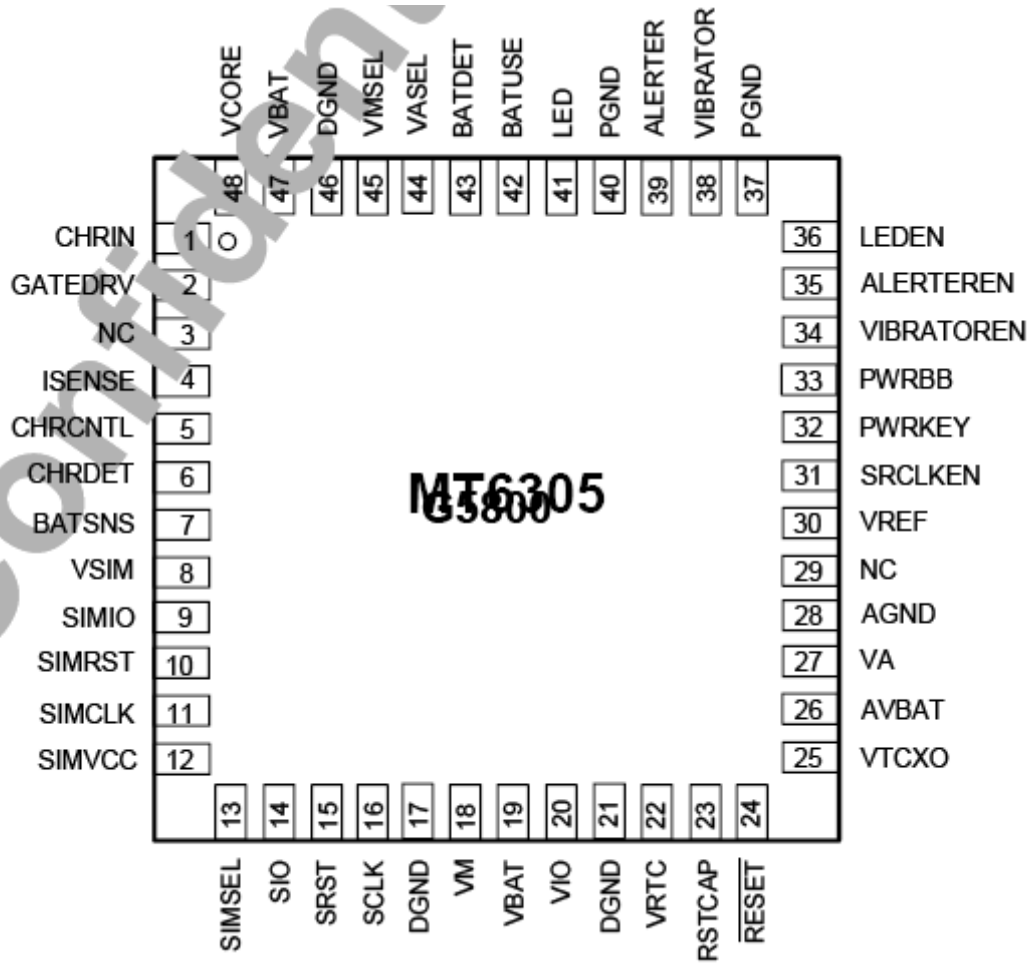
Pin	Mode0	Description		7332
		Datasheet	7332	Description
U2	GPIO_0	General purpose input/output 0	Not Used	Not Used
M19	GPIO_1	General purpose input/output 1	GPIO1_OP_EN	[Output] Audio Amp. Enable Control H: Audio Amp. active L: Audio Amp. shuntdown
L15	GPIO_2	General purpose input/output 2	GPIO2_UR1_CTL	[Output] Analog switch enable pin (Select UART or Audio) H: Audio (MP3_OUTL) L: UART (Default: HW pull low)
L16	GPIO_3	General purpose input/output 3	GPIO3_CM_PW_EN	[Output]: Camara Power (LDO) Enable Pin, High Active H: LDO Output Enable L: LDO sleep
C17	GPIO_4	General purpose input/output 4	GPIO4_FMRST	[Output] FM IC Rest Pin Active low
A19	GPIO_5	General purpose input/output 5	GPIO5_CAP	Reserve for touch sensor
B18	GPIO_6	General purpose input/output 6	Not Used	Not Used
B17	GPIO_7	General purpose input/output 7	STATUS_EN	[Output] Status LED Enable Pin to PMIC H: Status LED off L: Status LED on
A18	GPIO_8	General purpose input/output 19	SCL	I2C Interface, SCL
A17	GPIO_9	General purpose input/output 21	SDA	I2C Interface, SDA
G1	GPIO_10	RF hard-wire control bus 6	VIB_EN	[Output] Vibrator Enable Pin to PMIC Active High
H5	GPIO_11	RF hard-wire control bus 7	GPIO11_BT_26MHz	Reserve for 26MHz Clock to Bluetooth
H4	GPIO_12	RF hard-wire control bus 4	GPIO12_FM_32KHz	32KHz output to FM IC (U701)
H3	GPIO_13	RF hard-wire control bus 5	RFVCOEN	[Output] RFVCO Enable
M18	GPIO_14	SD Card Detect Input	SD_CLK	MicroSD serial clock
M17	GPIO_15	SD Write Protect Input	SD_CD	MicroSD detect input

J3	GPIO_16	Serial display interface data output	Not Used	Not Used
J2	GPIO_17	Serial display interface address output	Not Used	Not Used
J1	GPIO_18	Serial display interface clock output	GPIO18_LCM_ID	LCM Identification H: TBD L: LG LCD
K4	GPIO_19	Serial display interface chip select 0 output	Not Used	Not Used
K3	GPIO_20	Serial display interface chip select 1 output	Not Used	Not Used
R3	GPIO_21	Pulse width modulated signal 1	PWM1_LCM_EN	[PWM Output] LCM backlight brightness control See MT6226 datasheet Page79
R2	GPIO_22	Pulse width modulated signal 2	Not Used	Not Used
T4	GPIO_23	Pulse width modulated signal for buzzer	KP_BL_PWM1	[PWM Output] Keypad Backlight Control Signal See MT6226 datasheet Page81
K2	GPIO_24	Parallel display interface chip select 1 output	Not Used	Not Used
P5	GPIO_25	Nand-Flash Read/Busy Flag	NRNB	Reserve for NAND Flash
P4	GPIO_26	Nand-Flash Command Latch Signal	NCLE	Reserve for NAND Flash
P3	GPIO_27	Nand-Flash Address Latch Signal	NALE	Reserve for NAND Flash
P2	GPIO_28	Nand-Flash Write Strobe	NWEB	Reserve for NAND Flash
P1	GPIO_29	Nand-Flash Read Strobe	NREB	Reserve for NAND Flash
R4	GPIO_30	Nand-Flash Chip select output	NCEB	Reserve for NAND Flash
T2	GPIO_31	External TCXO enable input	GPIO31_CHR_CTL	[Output] Charging MOSFET Gate Drive Control
K16	GPIO_32	SIM card supply power select	SIMSEL	SIM card supply voltage select Output
H15	GPIO_33	UART 3 receive data	BT_URXD3	BlueTooth UART_RX data Input
H16	GPIO_34	UART 3 transmit data	BT_UTXD3	BlueTooth UART_TX data Output
J18	GPIO_35	UART 2 receive data	URXD2	Reserve for touch sensor
J19	GPIO_36	UART 2 transmit data	UTXD2	Reserve for touch sensor
H17	GPIO_37	IrDA receive data	Not Used	Not Used
G15	GPIO_38	IrDA transmit data	Not Used	Not Used

G16	GPIO_39	IrDA Power Down Control	Not Used	Not Used
W12	GPIO_40	External memory chip select 7	Not Used	Not Used
R5	GPIO_41	Interrupt to MCU	GPIO41_BT_LDOEN	[Output] Bluetooth Power LDO Enable Control H: LDO output enable L: Sleep
R17	GPIO_42	Interrupt to MCU	GPIO41_BT_RESET	[Output] BlueTooth Reset Cortorl
D17	GPIO_43	DAI clock output	BT_DAICLK	BlueTooth Synchronous data clock
D18	GPIO_44	DAI pcm data out	BT_DAIPCMOUT	BlueTooth Synchronous data Outtput
C19	GPIO_45	DAI pcm data input	BT_DAIPCMIN	BlueTooth Synchronous data Intput
B19	GPIO_46	DAI frame synchronization signal output	BT_DAISYNC	BlueTooth Synchronous data sync
C18	GPIO_47	DAI reset signal input	DAIRST	Test Point
J12	GPIO_48	Image sensor reset signal output	CMRST	[Output] Carama Rest Enable Pin, Low Active H: Normal L: Reset
K12	GPIO_49	Image sensor power down control	CMPDN	[Output] Camara Power Down Mode Selection H: Power down mode L: Normal mode
M12	GPIO_50	Image sensor data input 1	Not Used	Not Used
L12	GPIO_51	Image sensor data input 0	Not Used	Not Used
U12	GPIO_52	External memory chip select 6	Not Used	Not Used
T12	GPIO_53	External memory chip select 5	Not Used	Not Used
R12	GPIO_54	External memory chip select 4	Not Used	Not Used
G6	GPIO_55	Parallel LCD/Nand-Flash Data 16	Not Used	Not Used
F6	GPIO_56	Parallel LCD/Nand-Flash Data 17	Not Used	Not Used

7. Device Information

MT6305(PMUIC)

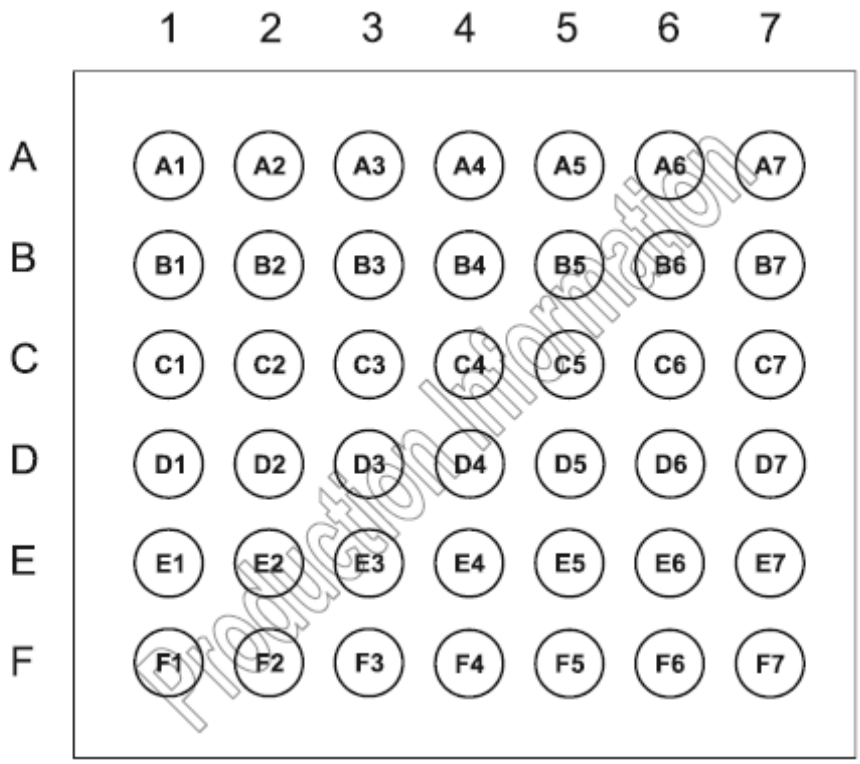


PIN sheet

PI	NAM	FUNCTI
1	CHRIN	Charger Input Voltage
2	GATEDRV	Gate Drive Output
3,29	NC	
4	ISENSE	Charger Current Sense Input
5	CHRCNTL	Microprocessor Control Input Signal for Gate Drive, Internal Pull Low
6	CHRDET	Charger Detect Output
7	BATSNS	Battery Input Voltage Sense
8	VSIM	SIM Supply
9	SIMIO	Non-Level-Shifted Bidirectional Data I/O
10	SIMRST	Non-Level-Shifted SIM Reset Input, Internal Pull High to VIO
11	SIMCLK	Non-Level-Shifted SIM Clock Input
12	SIMVCC	SIM Enable
13	SIMSEL	High for Vsim=3.0V, Low for Vsim=1.8V
14	SIO	Level-Shifted SIM Bidirectional Data Input/Output
15	SRST	Level-Shifted SIM Reset Output
16	SCLK	Level-Shifted SIM Clock Output
17,21,46	DGND	Digital Ground
18	VM	Memory Supply
19	VBAT	Battery Input Voltage
20	VIO	Digital IO Supply
22	VRTC	Real Time Clock Supply
23	RSTCAP	Reset Delay Time Capacitance
24	/RESET	System Reset, Low Active
25	VTCXO	TCXO Supply
26	AVBAT	Battery Input Voltage for Analog Block Circuits

27	VA	Analog Supply
28	AGND	Analog Ground
30	VREF	Reference Voltage Output
31	SRCLKEN	VTCXO and VA Enable
32	PWRKEY	Power on/off Key, Internal Pull High to VBAT
33	PWRBB	Power on/off Signal from Microprocessor
34	VIBRATOREN	Vibrator Driver Enable, Internal Pull Low to DGND
35	ALERTEREN	Alerter Driver Enable, Internal Pull Low to DGND
36	LEDEN	LED Driver Enable, Internal Pull Low to DGND
37,40	PGND	Power Ground
38	VIBRATOR	Vibrator Driver Input
39	ALERTER	Alerter Driver Input
41	LED	LED Driver Input
42	BATUSE	Battery Type Selection, High for NiMH, Low for Li-ion, Internal Pull
43	BATDET	Battery Detect Input, Low for Battery Connected, Internal Pull High
44	VASEL	High for VA enabled with VTCXO, Low for VA enabled with VD,
45	VMSEL	High for Vm=2.8 V, Low for Vm=1.8V, Internal Pull High to VIO
47	VBAT	Battery Input Voltage
48	VCORE	Digital Core Supply

Bluetooth



Pin Sheet

Radio	Ball	Pad Type	Description
TX-A	D1	Analogue	Transmitter output/Switched Receiver input
TX_B	E1	Analogue	Complement of TX_A

Synthesiser and Oscillator	Ball	Pad Type	Description
XTAL_IN	A1	Analogue	For crystal or external clock input
XTAL_OUT	A3	Analogue	Drive for crystal

PCM Interface	Ball	Pad Type	Description
PCM_OUT	D5	CMOS output, tri-state with weak internal pull-down	Synchronous data output
PCM_IN	B7	CMOS input, with weak internal pull-down	Synchronous data input
PCM_SYNC	C5	Bi-directional with weak internal pull-down	Synchronous data sync
PCM_CLK	B6	Bi-directional with weak internal pull-down	Synchronous data clock

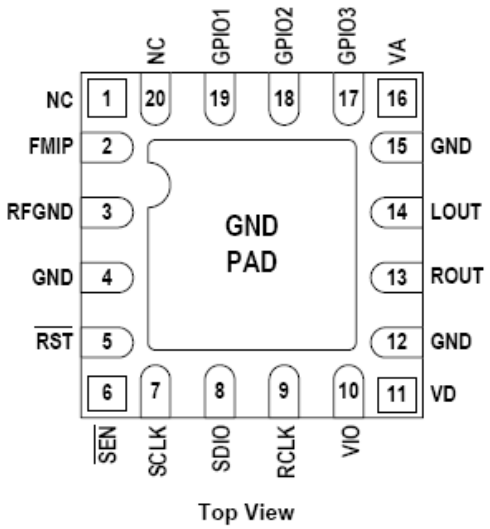
TART	Ball	Pad Type	Description
UART_TX	D4	CMOS output tri-state with weak internal pull-up	UART data output active high
UART_RX	B5	CMOS input, with weak internal pull-down	UART data input active high
UART_RTS	A7	CMOS output, tri-state with weak internal pull-up	UART request to send active low
UART_CTS	C4	CMOS input with weak internal pull-down	UART clear to send active low

TART	Ball	Pad Type	Description
RESETB	E8	CMOS input with weak internal pull-up	Reset if low. Input debounced so must be low for >5ms to cause a reset
SPI_CSB	F8	CMOS input with weak internal pull-up	Chip select for Synchronous Serial Interface active low
SPI_CLK	F5	CMOS input with weak internal pull-down	Serial Peripheral Interface clock
SPI_MOSI	F4	CMOS input with weak internal pull-down	Serial Peripheral Interface data input
SPI_MISO	F7	CMOS output tri-state with weak internal pull-down	Serial Peripheral Interface data output
TEST_EN	F3	CMOS input with weak internal pull-down	For test purposes only (leave unconnected)

TART	Ball	Pad Type	Description
PIO[0]	D3	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[1]	C3	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[2]	E3	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[3]	F2	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[4]	E5	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[5]	E4	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[6]	D7	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[7]	D6	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO[0]	C2	Bi-directional	Programmable input/output line
PIO[2]	A5	Bi-directional	Programmable input/output line

7. Device Information

FM (radio)

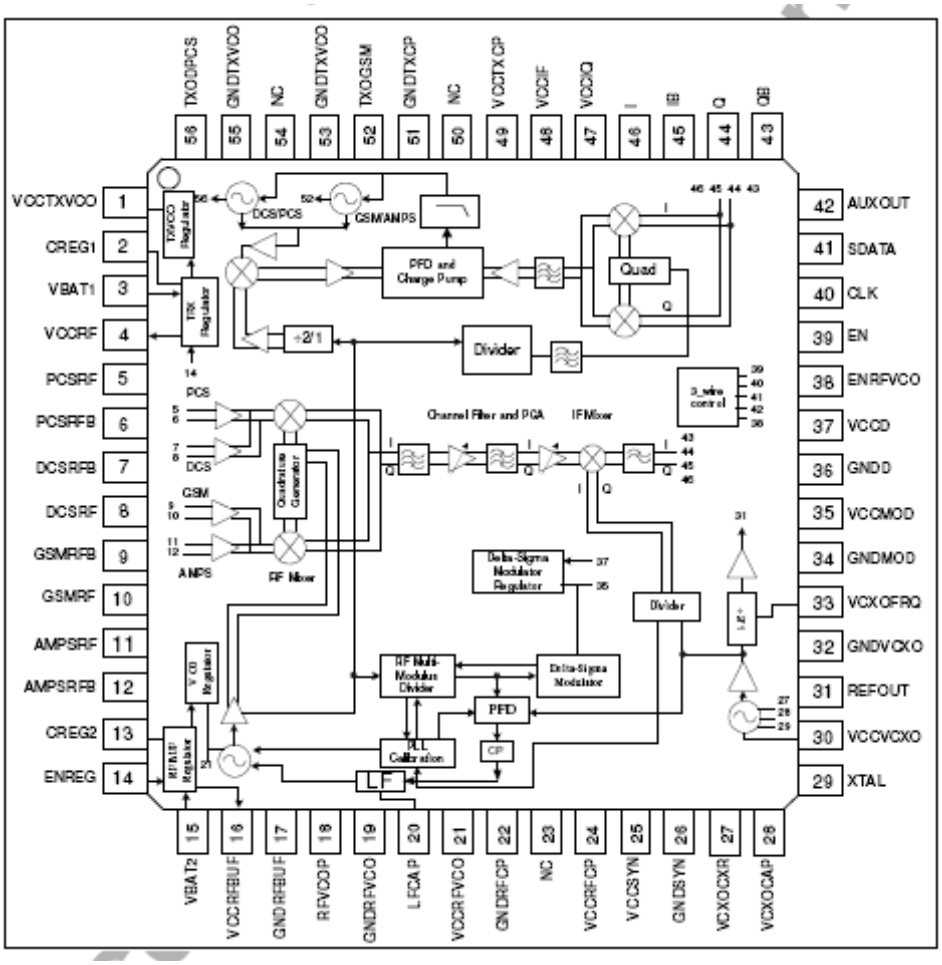


Top View

Pin Number(s)	Name	Description
1,20	NC	No Connect. Leave floating.
2	FMIP	FM RF inputs.
3	RFGND	RF ground. Connect to ground plane on PCB.
4, 12, 15, PAD	GND	Ground. Connect to ground plane on PCB.
5	$\overline{RST}$	Device reset (active low) input.
6	$\overline{SEN}$	Serial enable input (active low).
7	SCLK	Serial clock input.
8	SDIO	Serial data input/output.
9	RCLK	External reference oscillator input.
10	V_{IO}	I/O supply voltage.
11	V_D	Digital supply voltage. May be connected directly to battery.
13	ROUT	Right audio output.
14	LOUT	Left audio output.
16	B_A	Analog supply voltage. May be connected directly to battery.
17, 18, 19	GPIO3, GPIO2, GPIO1	General purpose input/output.

TRANSCEIVER

1. Function Block



7. Device Information

2. Pin List

Pin Description

Pin No.	Pin Name	Description
1	VCCTXVCO	TX VCO supply voltage and Regulator 1(TX VCO) voltage output.
2	CREG1	Regulator 1 external noise bypass capacitor
3	VBAT1	Battery supply for Regulator 1
4	VCCRF	TRX RF and TX BUF block supply voltage and Regulator 1(TRX) voltage output
5	PCSRF	Receiver PCS 1900 RF differential positive input
6	PCSRFB	Receiver PCS 1900 RF differential negative input
7	DCSRFB	Receiver DCS 1800 RF differential negative input
8	DCSRF	Receiver DCS 1800 RF differential positive input
9	GSMRFB	Receiver E-GSM 900 RF differential negative input
10	GSMRF	Receiver E-GSM 900 RF differential positive input
11	AMPSRF	Receiver GSM 850 RF differential negative input
12	AMPSRFB	Receiver GSM 850 RF differential positive input
13	CREG2	Receiver 2 external noise bypass capacitor
14	ENREG	Regulator 1 & 2 enable input for TRX/RFVCO buffer/Synthesizer/VCXO
15	VBAT2	Battery supply for Regulator 2
16	VCCRFBUF	RF VCO buffer supply voltage and Regulator 2 (SX) voltage output
17	GNDRFBUF	RF VCO buffer ground
18	RFVCOP	RF VCO differential positive test output
19	GNDRFVCO	RF VCO ground
20	LFCAP	Loop filter main capacitor input
21	VCCRFVCO	RF VCO supply voltage and Regulator 2 (RF VCO) voltage output
22	GNDRFCP	Synthesizer charge pump and PFD ground
23	NC	No connection
24	VCCRFCP	Synthesizer charge pump and PFD supply voltage
25	VCCSYN	Synthesizer supply voltage
26	GNDSYN	Synthesizer ground
27	VCXOCXR	VCXO internal / external output buffer control
28	VCXOCAP	VCXO coarse tuning capacitor and fine tuning varactor

Section 8

ATE TOOL

8. ATE TOOL

Environment Requirement
OS

• MS Windows 2000 or XP

Hardware:

• Generic Pentium III or above PC (256M RAM or above)

• GPIB Card

- National Instruments GPIB device and driver
- Agilent GPIB card and driver
- KEITHLEY GPIB card and driver

• Radio Communication Tester

- Rohde & Schwarz CMU 200
- Agilent 8960 (1960A ,1968A firmware)
- Anritsu MT8820
- Rohde & Schwarz CMD55
- Willtek WT4400
- Agilent N4010A (for Bluetooth test)
- Rohde & Schwarz CBT (for Bluetooth test)
- Anritsu MT88852 (for Bluetooth test)

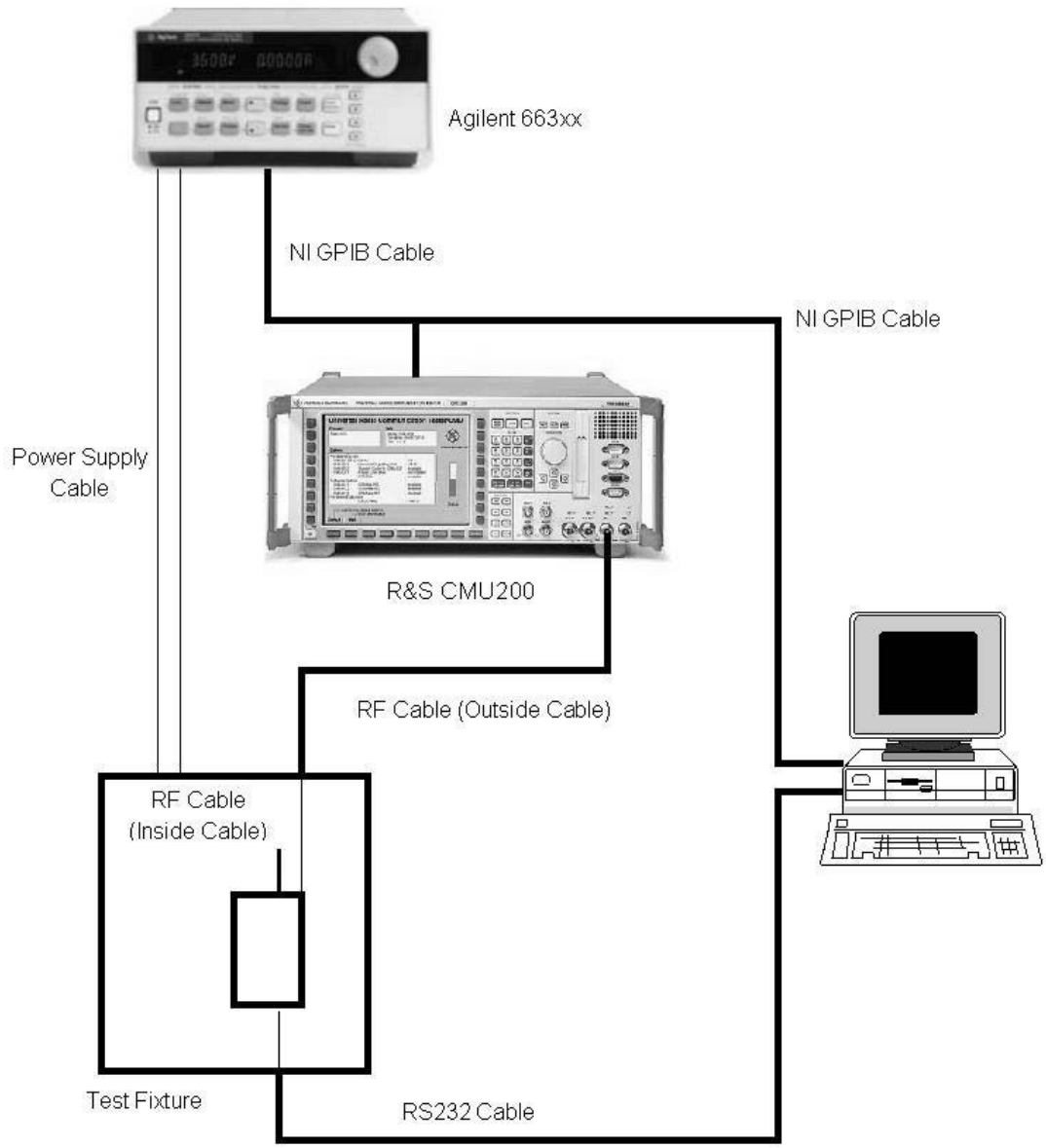
• DC Power Supply

- Agilent 661x or Agilent 663x2 series power supply
- R&S NGSM Power Supply
- KEITHLEY 2303, 2304, 2306
- Agilent 3631A power supply
- Willtek WT4400 power supply option

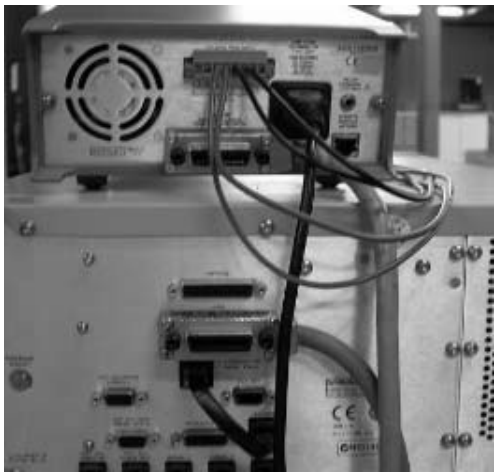
Others

USB download cable
Bummy battery
RF cable

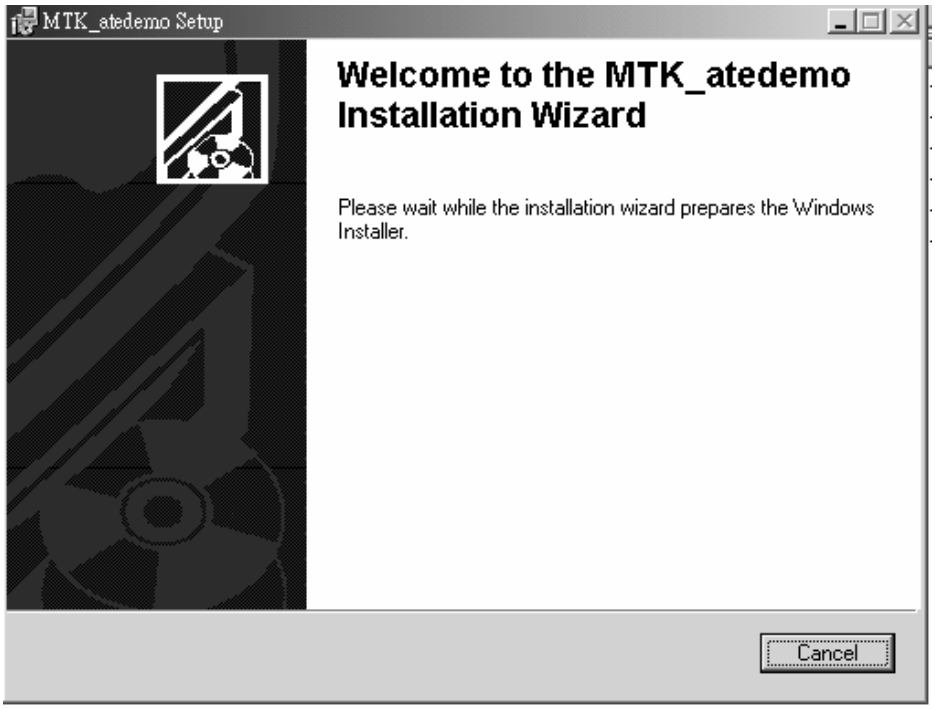
The following diagrams depic the system setups when using the R&S CMU200 or Agilent test platform.



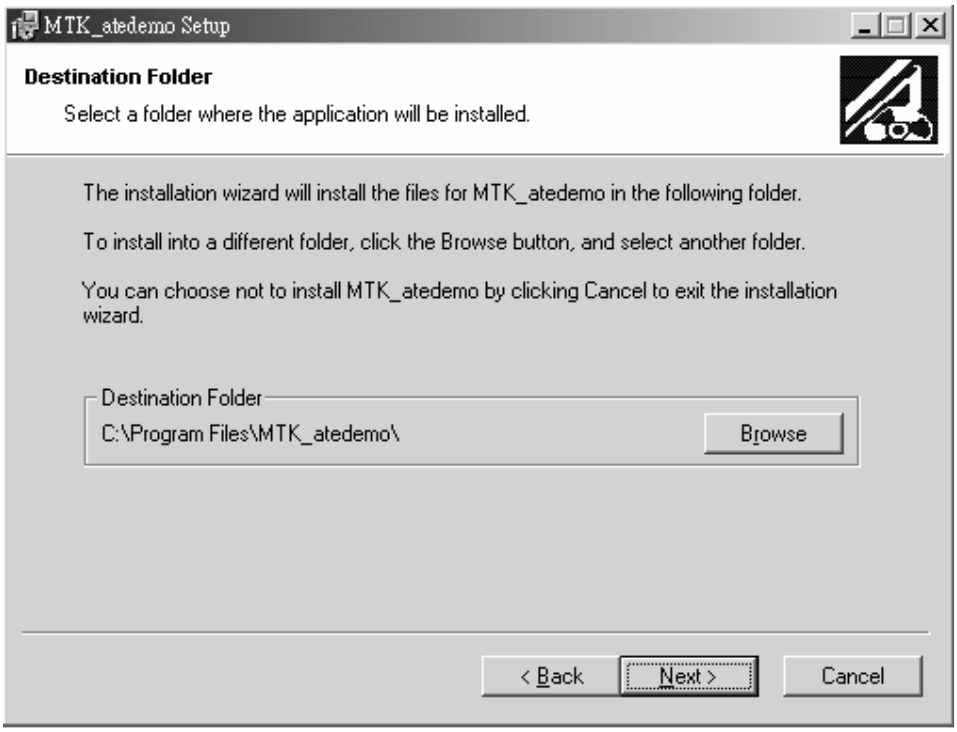
Connect 8960, power supply, computer, phone



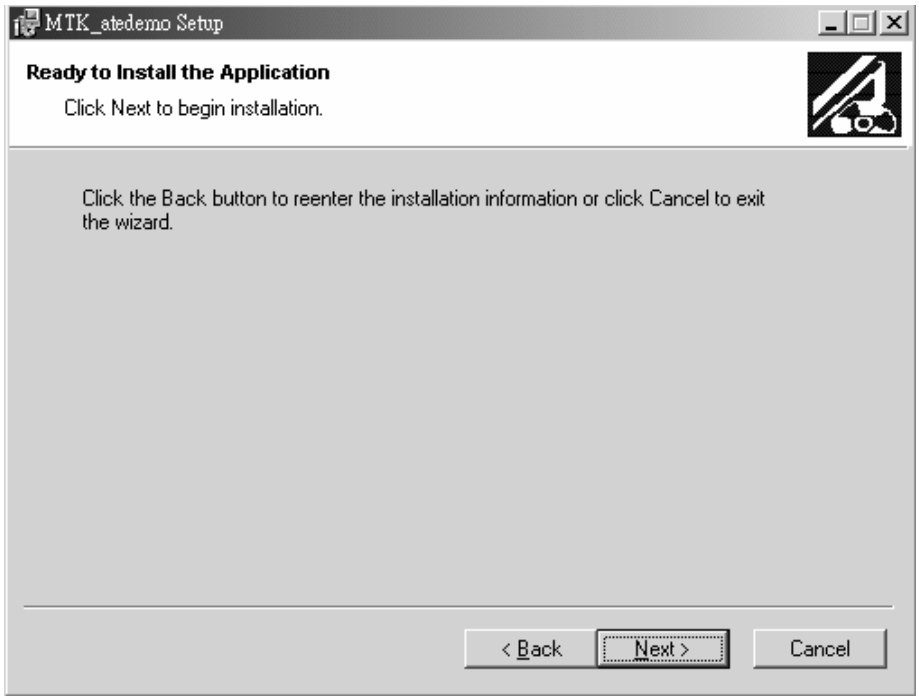
To install the MTK ATE tool, execute the setup.exe file. The Installation Wizard guides the user through the installation process step by step.



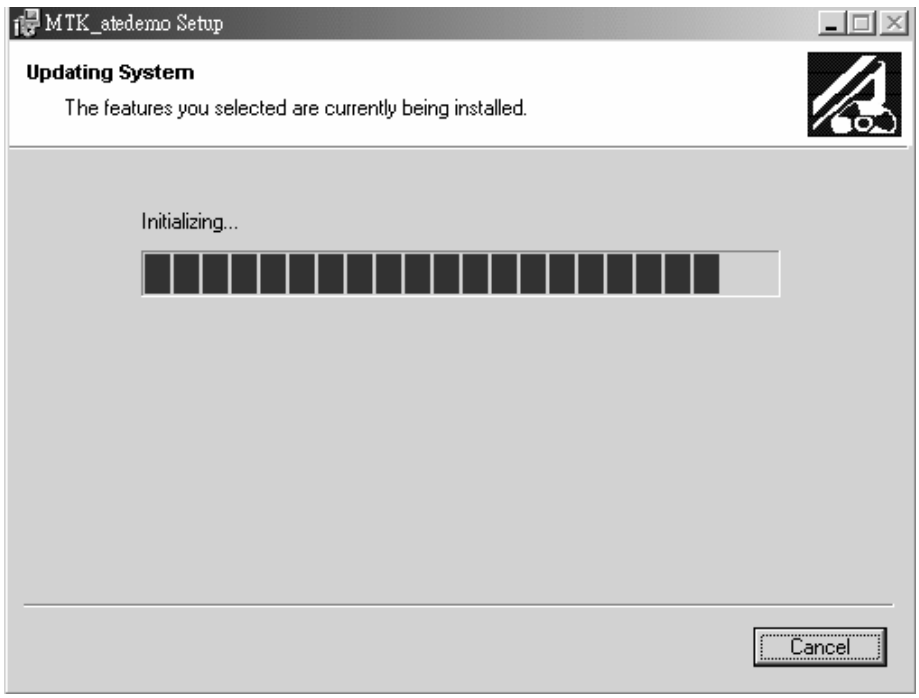
Press Next



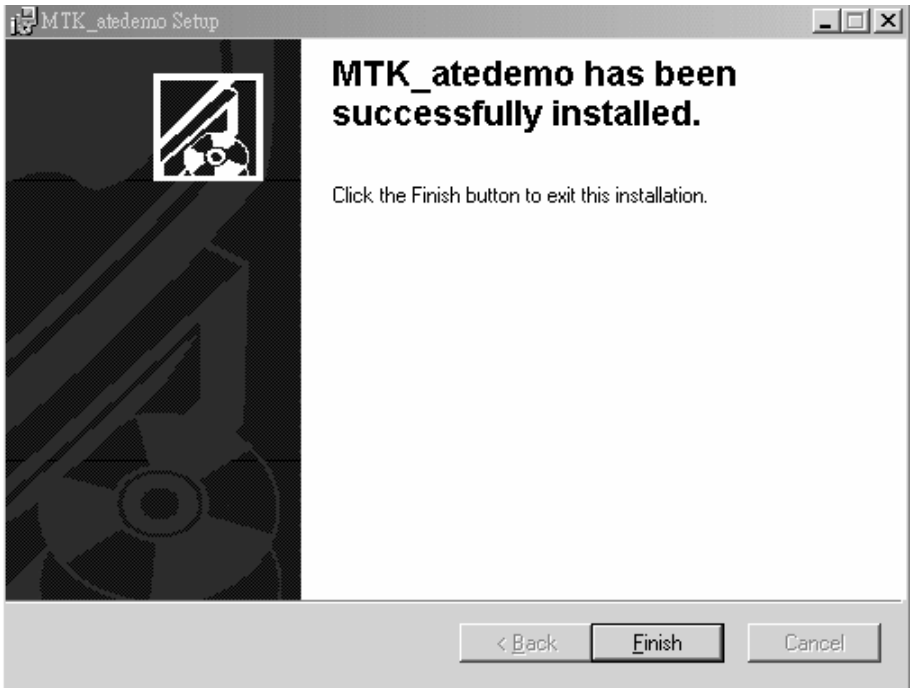
Press Next



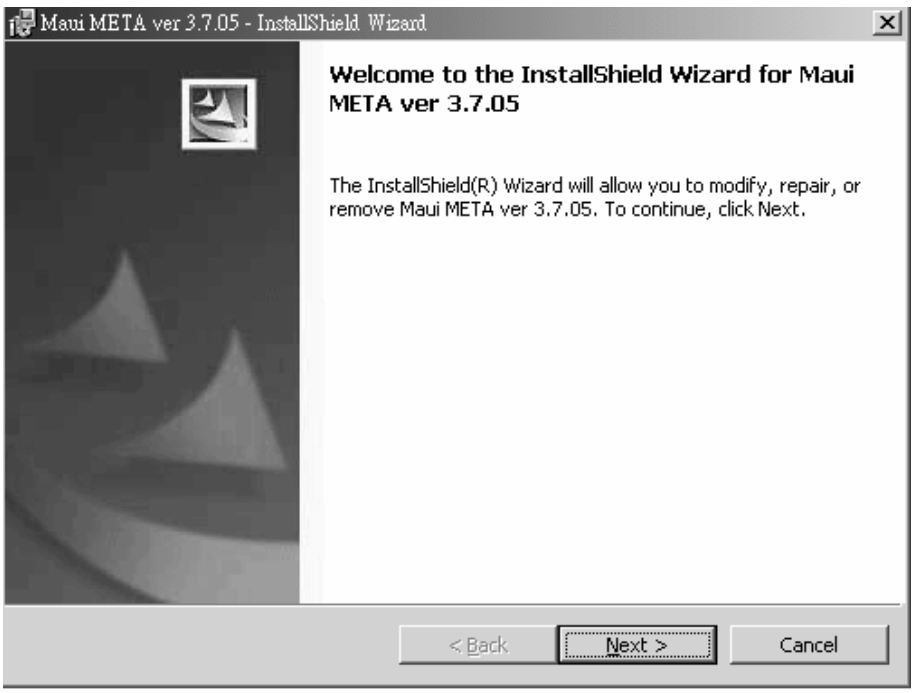
START INSTALL



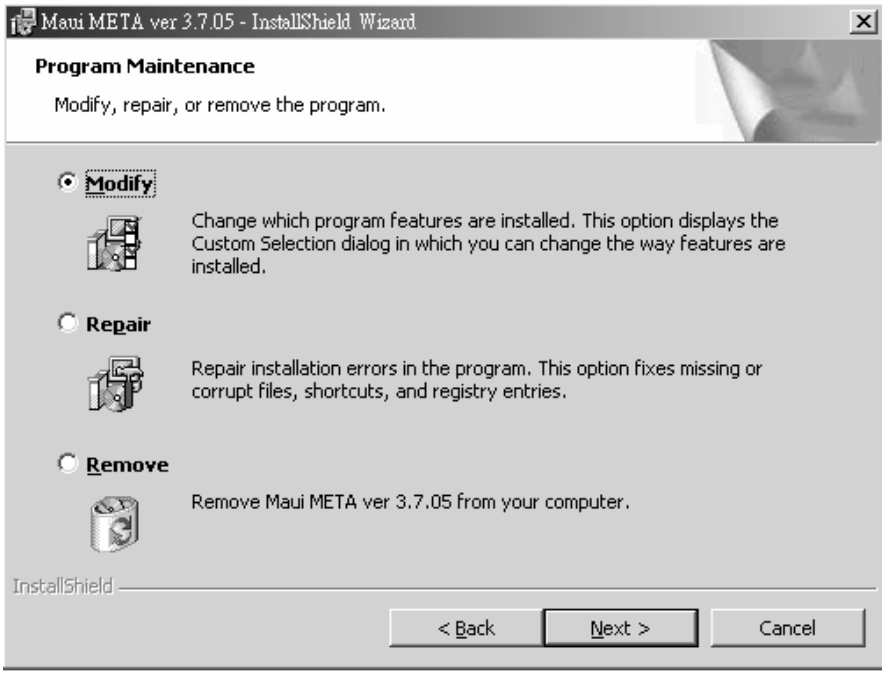
PRESS FINISH AND INSTALL FINISH



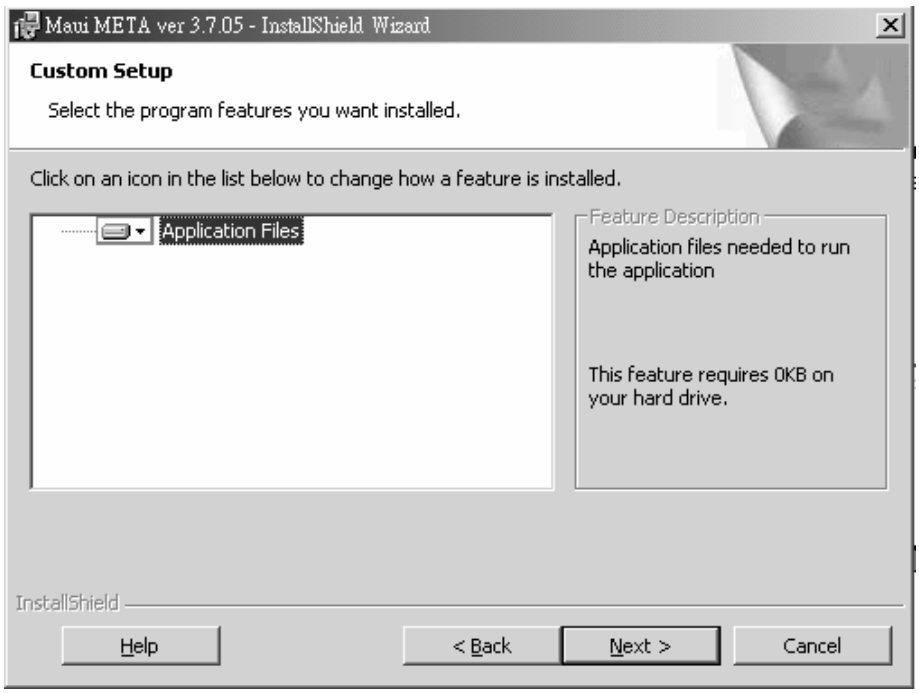
Install META and press Next



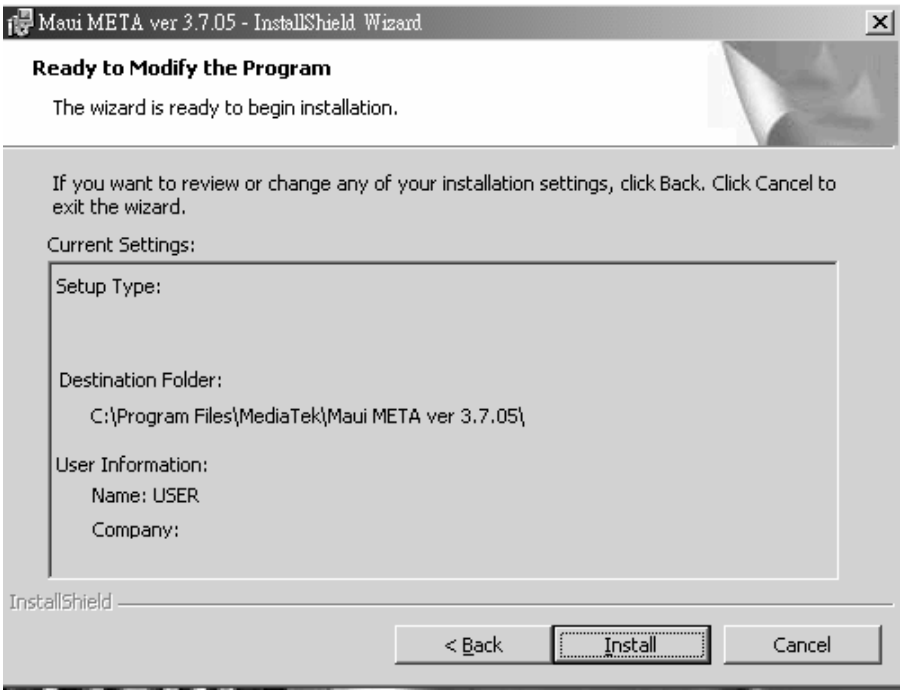
Choose Modify and press NEXT



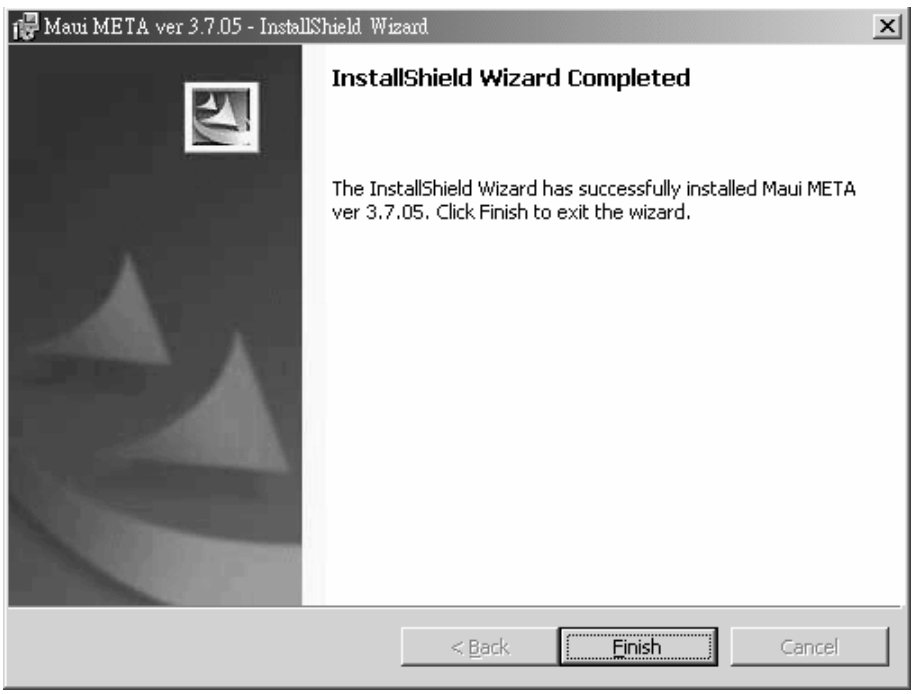
Press NEXT



Press Install

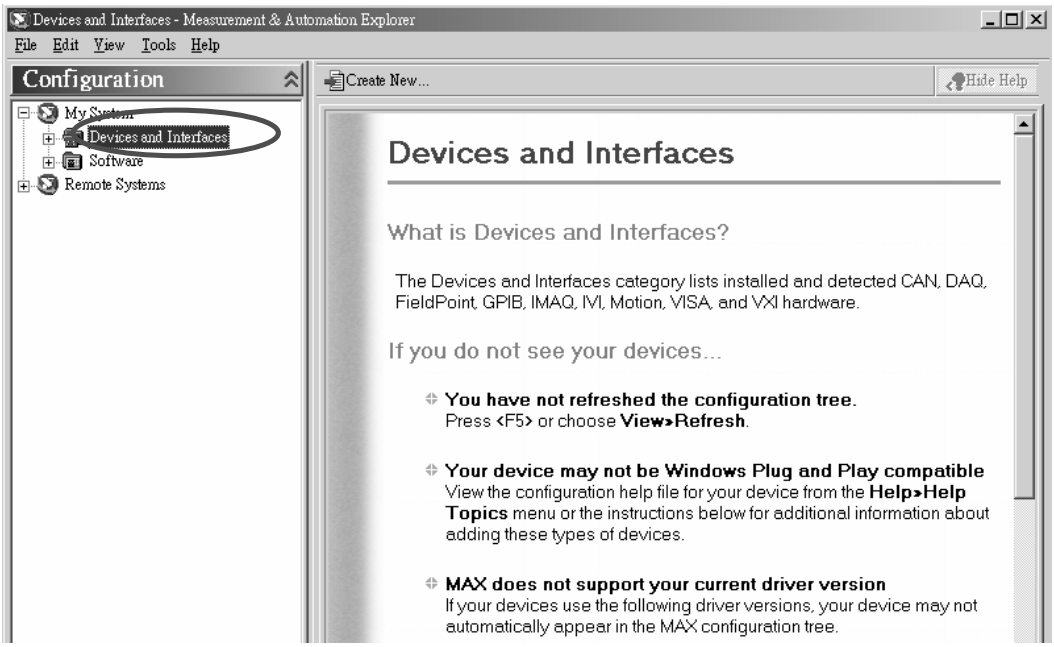


Press Finish

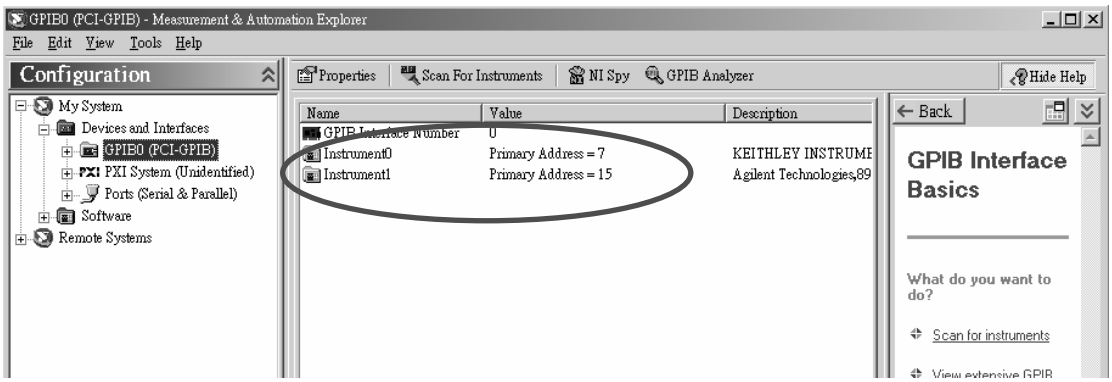


Execute Measurement & Automation to check equipment address

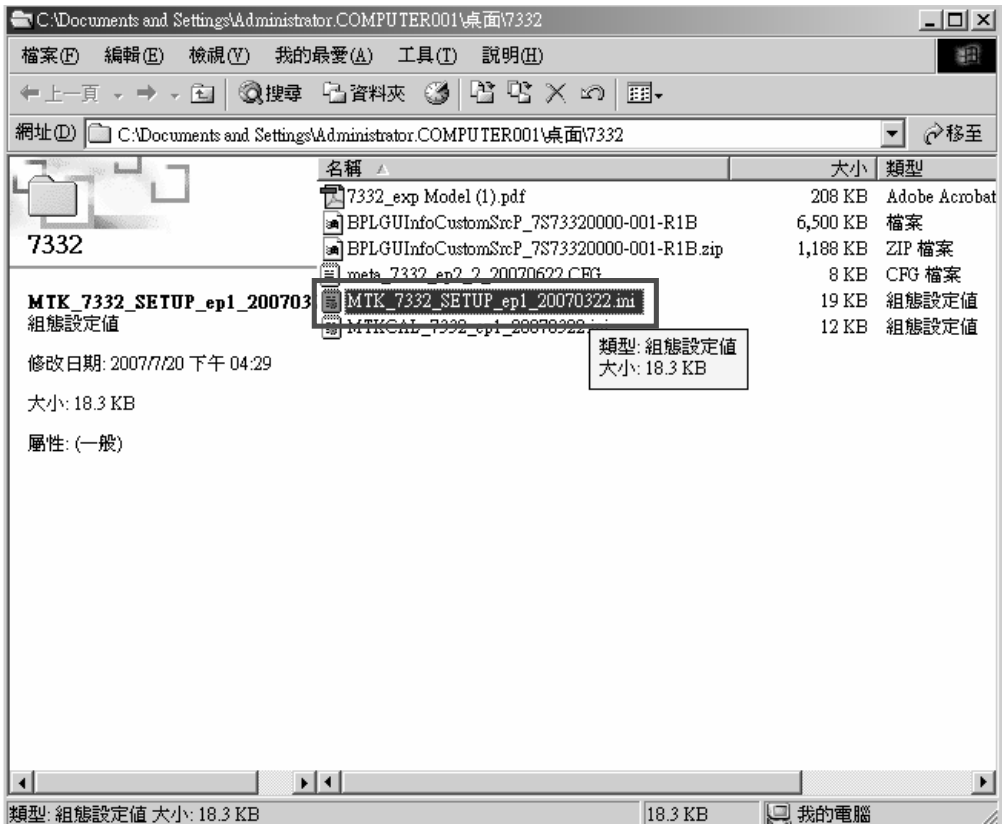
Choose Devices and Interfaces



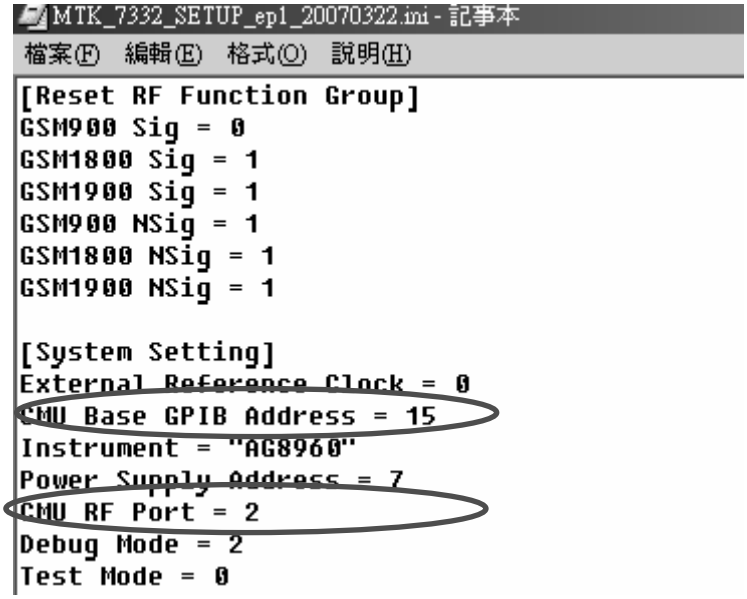
You can see your equipment adderss



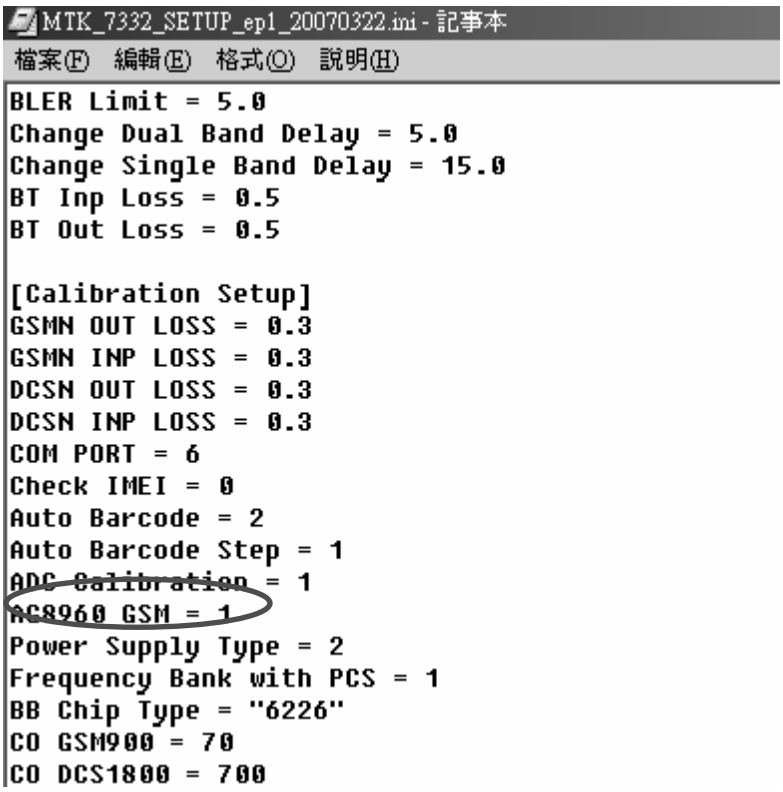
Choose MTK_7332_SETUP_ep1_20070322.ini and open the file to setup from data files



Setup your CMU Base GPIB Adderss and power supply address



Please setting AG8960 GSM = 1 and save the file

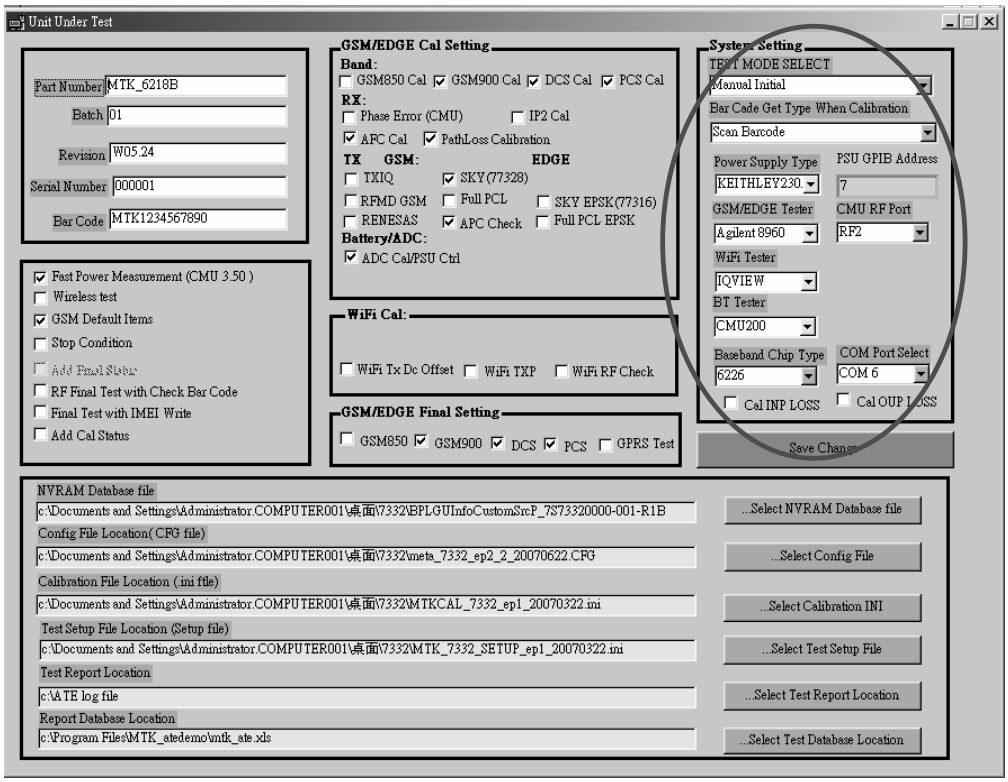


ATE Tool system setting

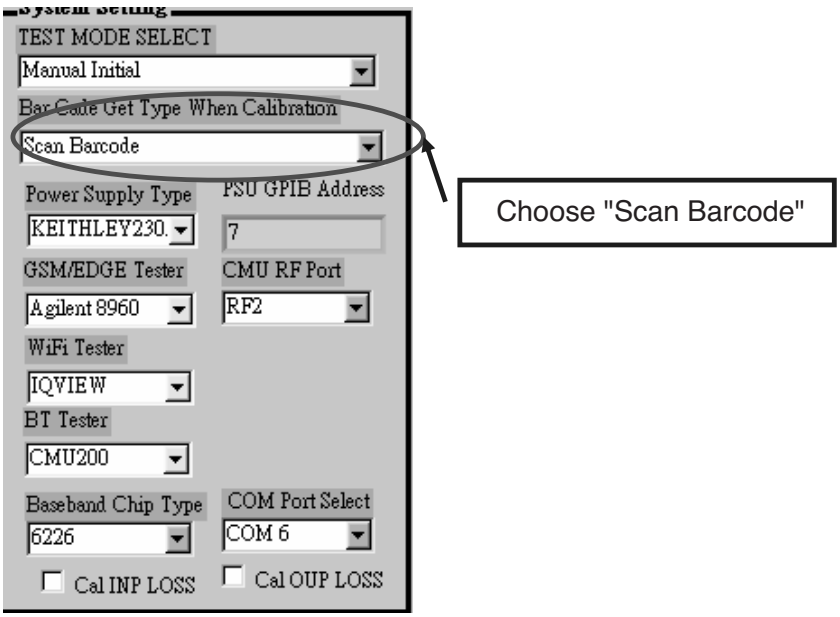
Execute MTK_atedemo

Press Report & System button

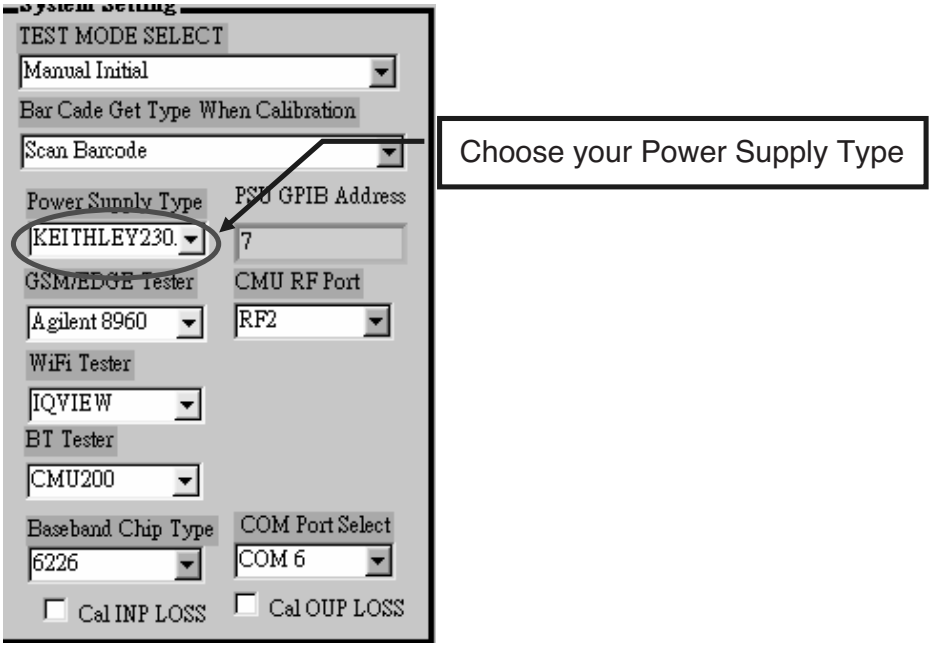
Setting your equipment



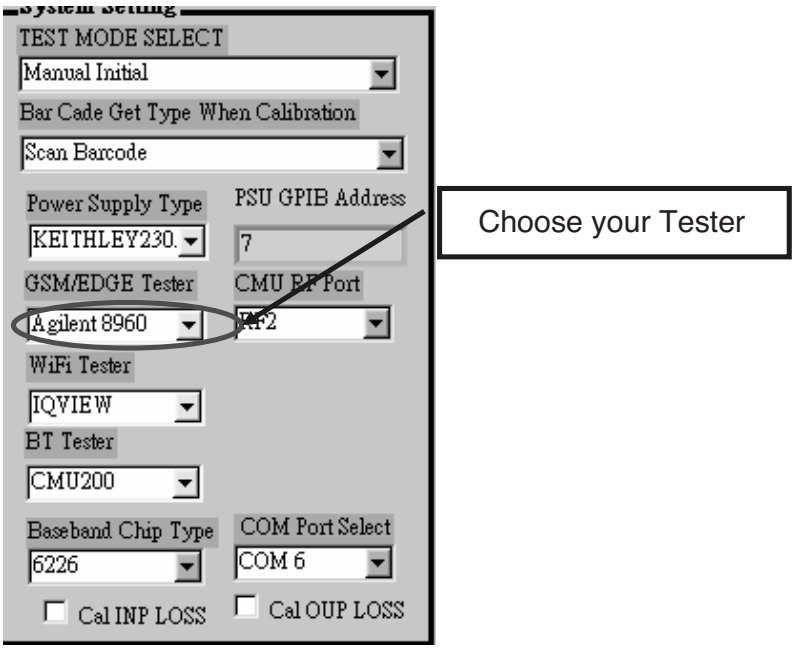
Setting Bar Cade Get Type When Calibration



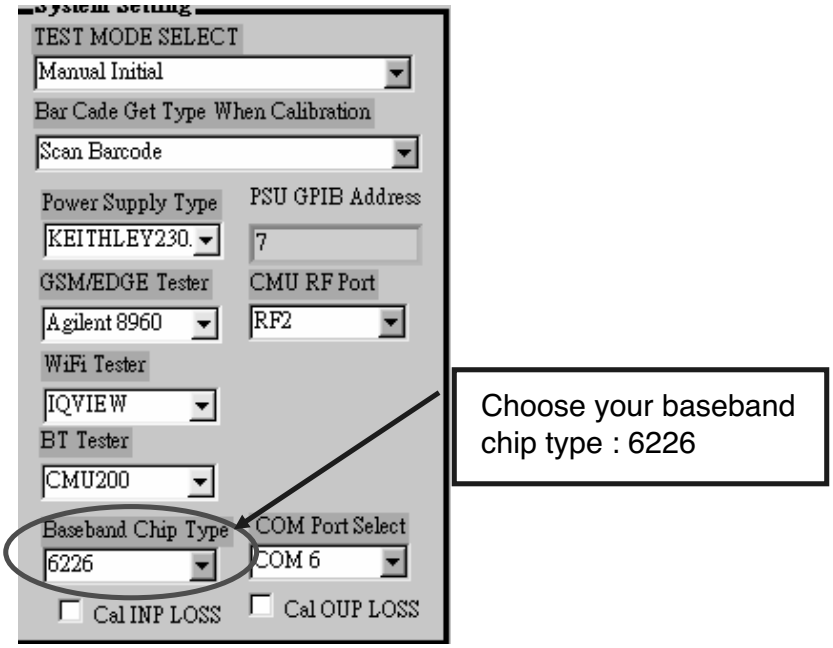
Setting your power supply type



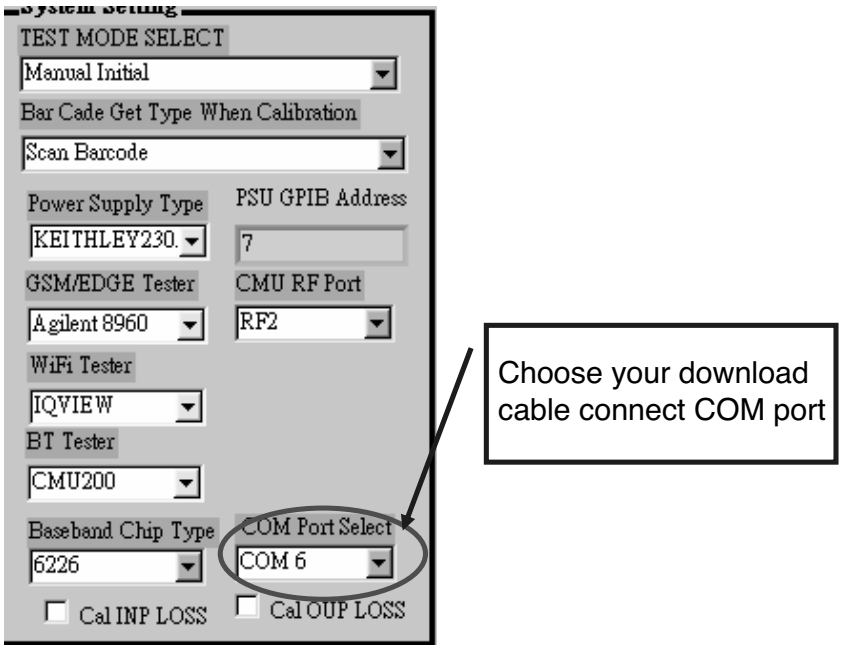
Setting your GSM/EDGE Tester



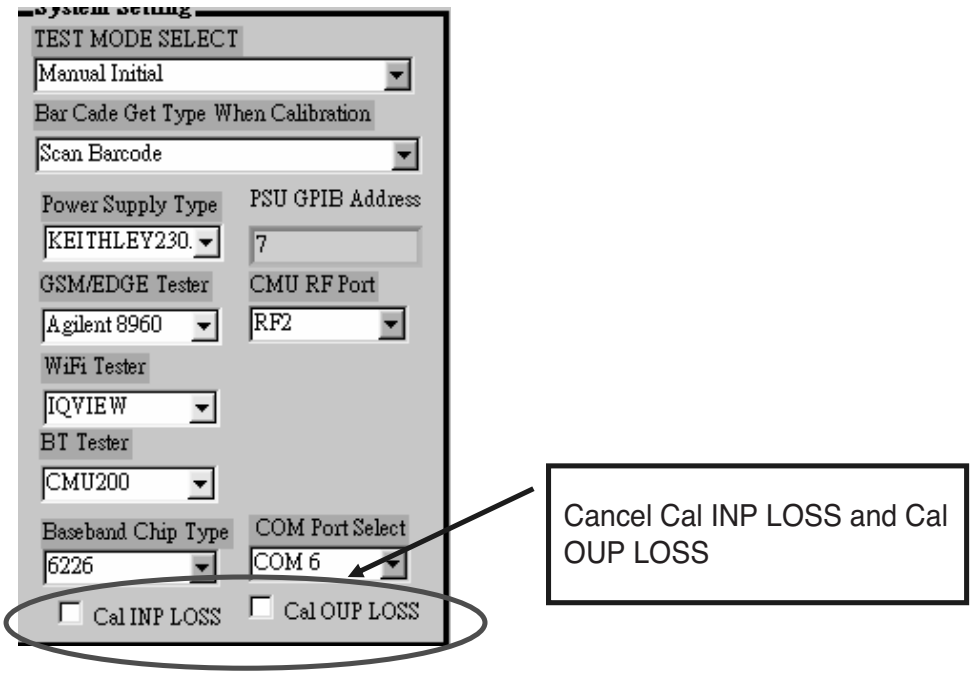
Choose Baseband Chip Type



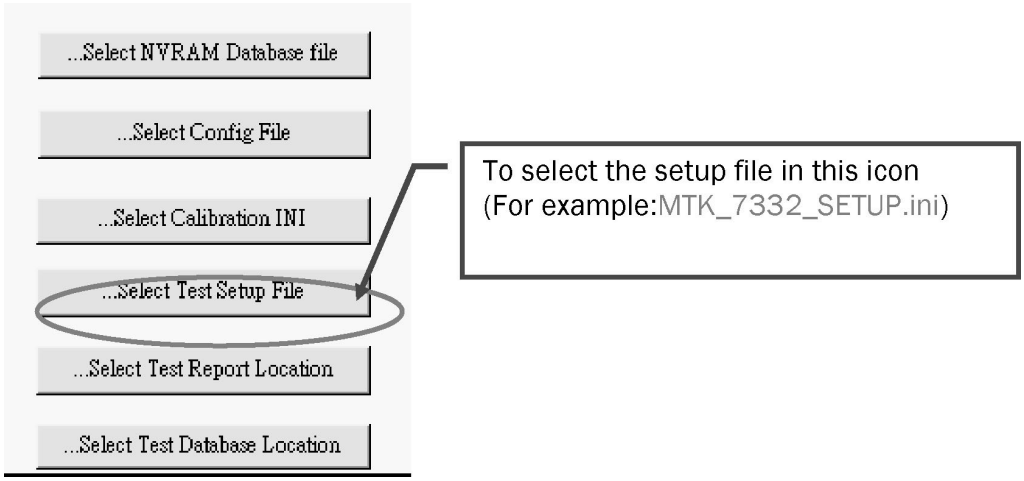
Choose your download com port



Cancel Loss

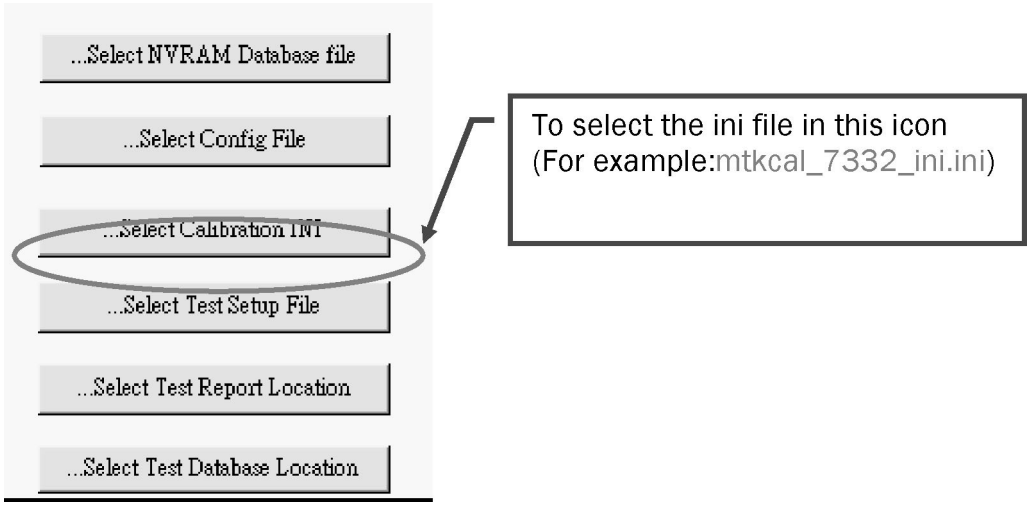


Choose “select test setup file”

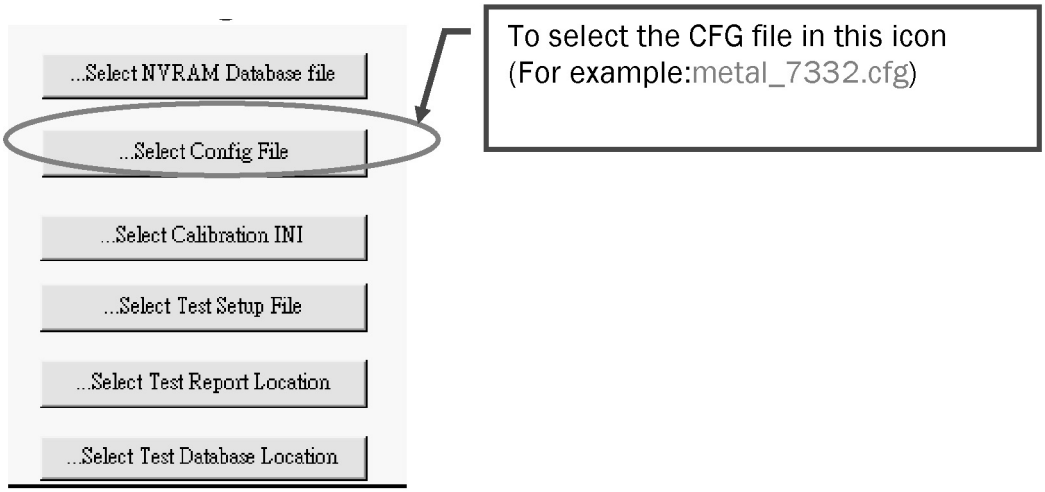


Execute MTK_atedemo again

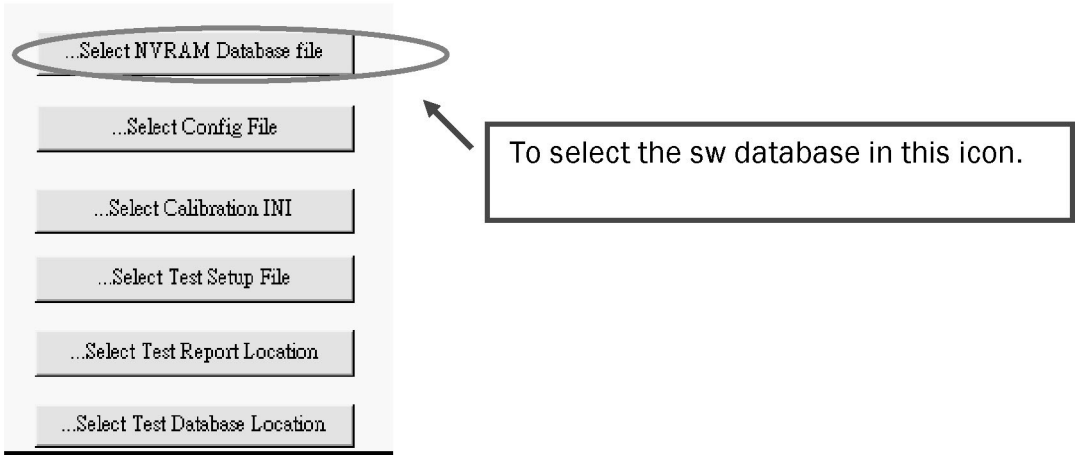
Choose Calibration INI



Choose Config File



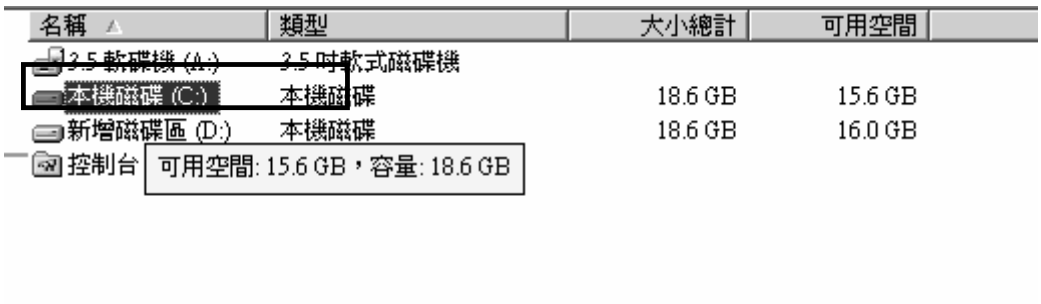
Choose NVRAM Database file



How to setup your test report location

Choose my computer

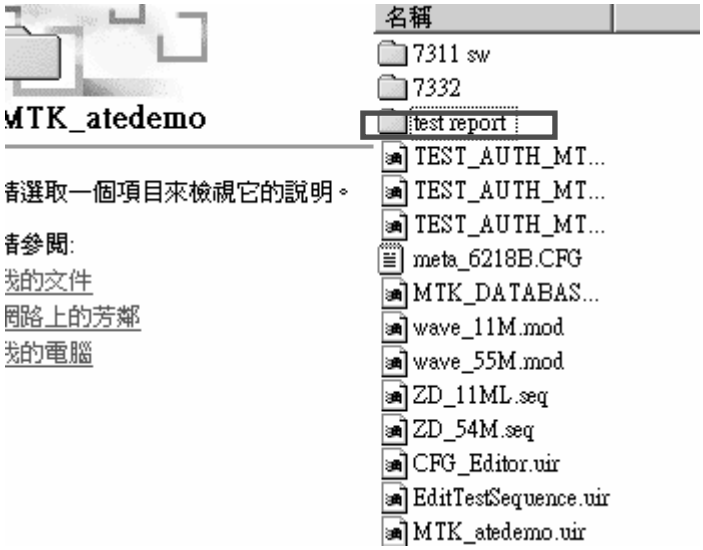
Choose “C”disk



Choose “program files”

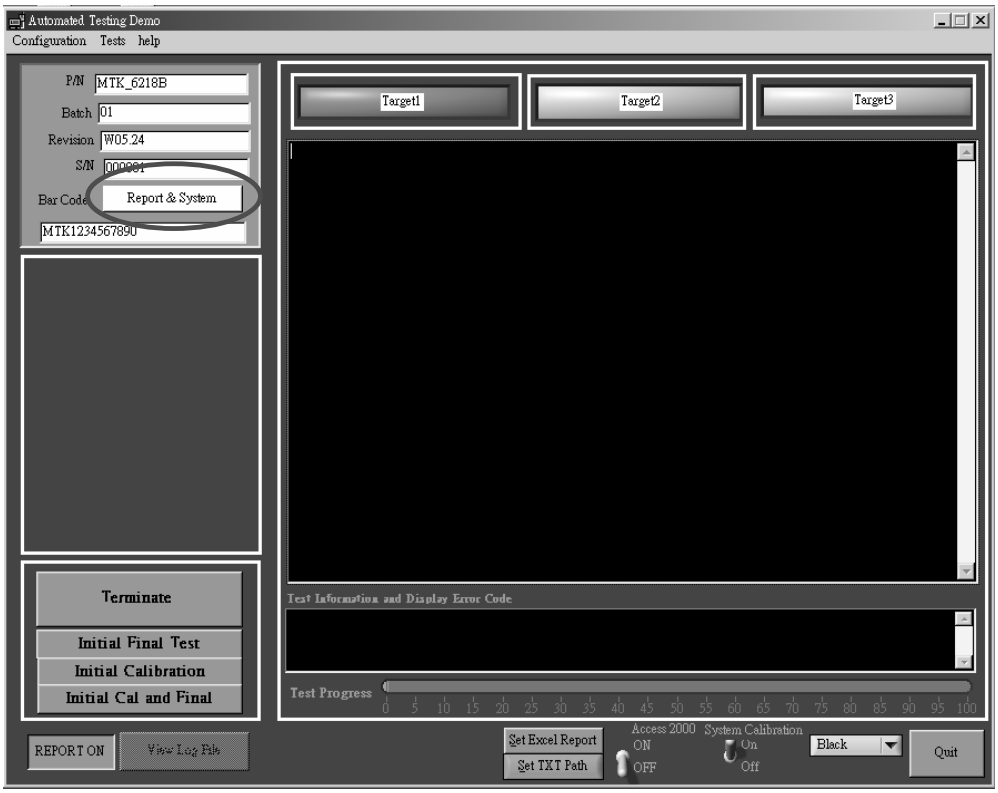
Choose “MTK_atedemo”files

Setup new file and leave the window

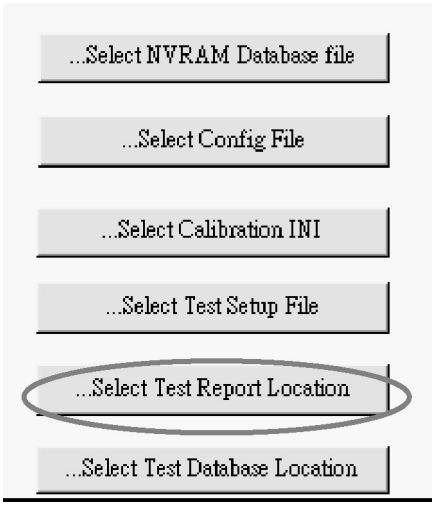


Execute MTK_atedemo

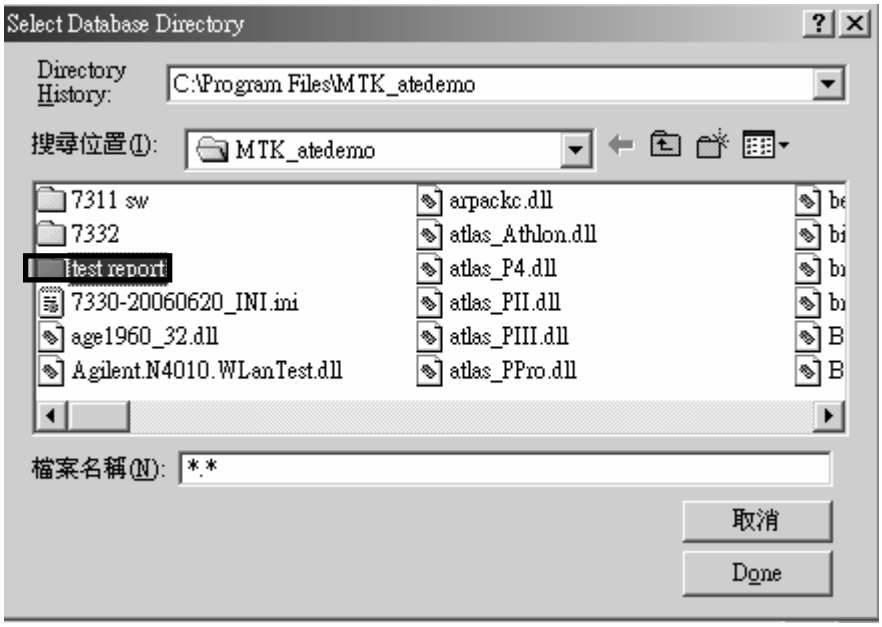
Press Report & System button



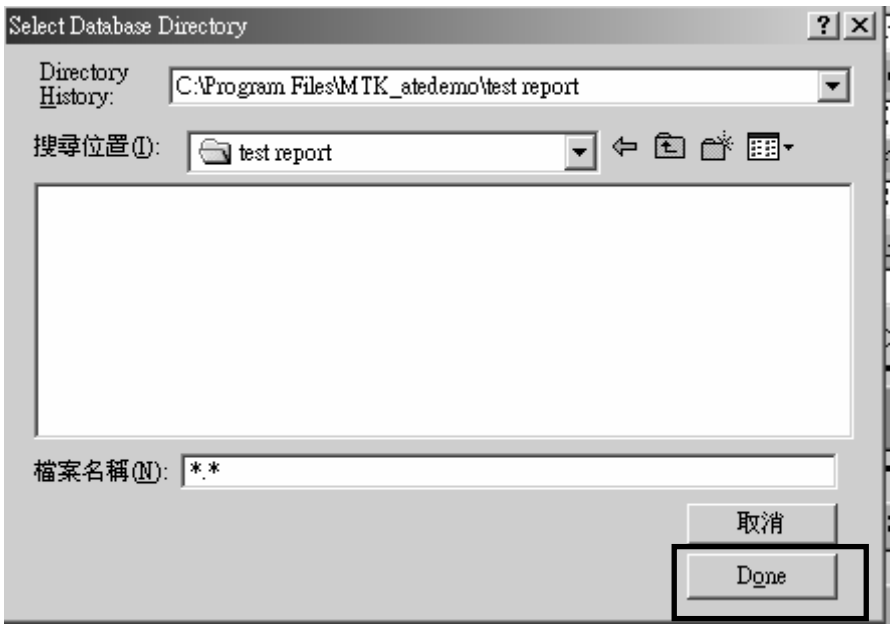
Press “select test report locatuion”



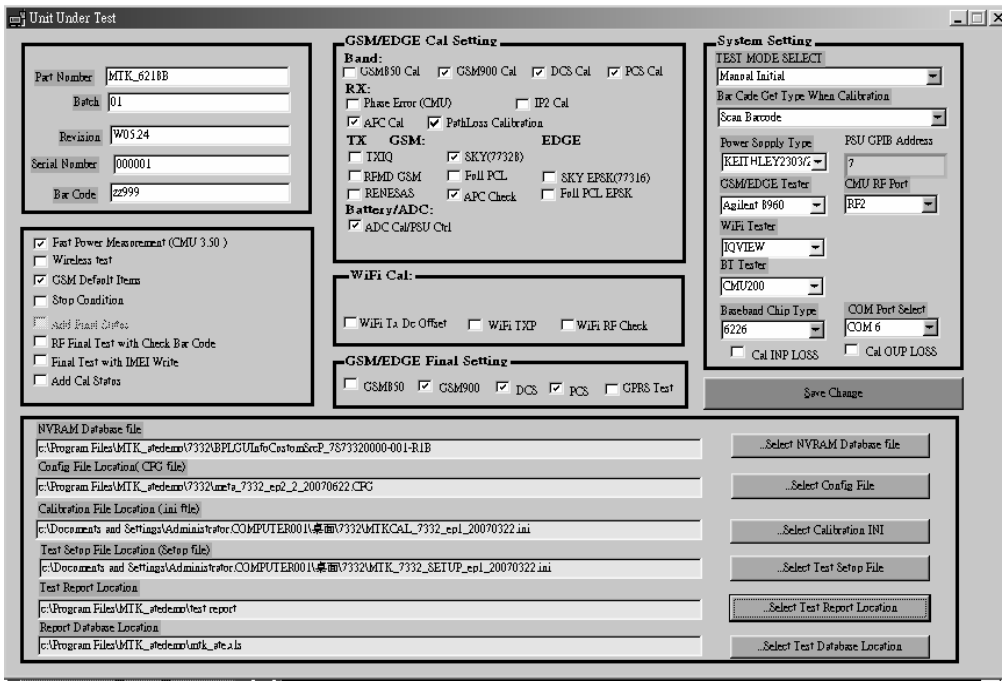
Choose your setup report



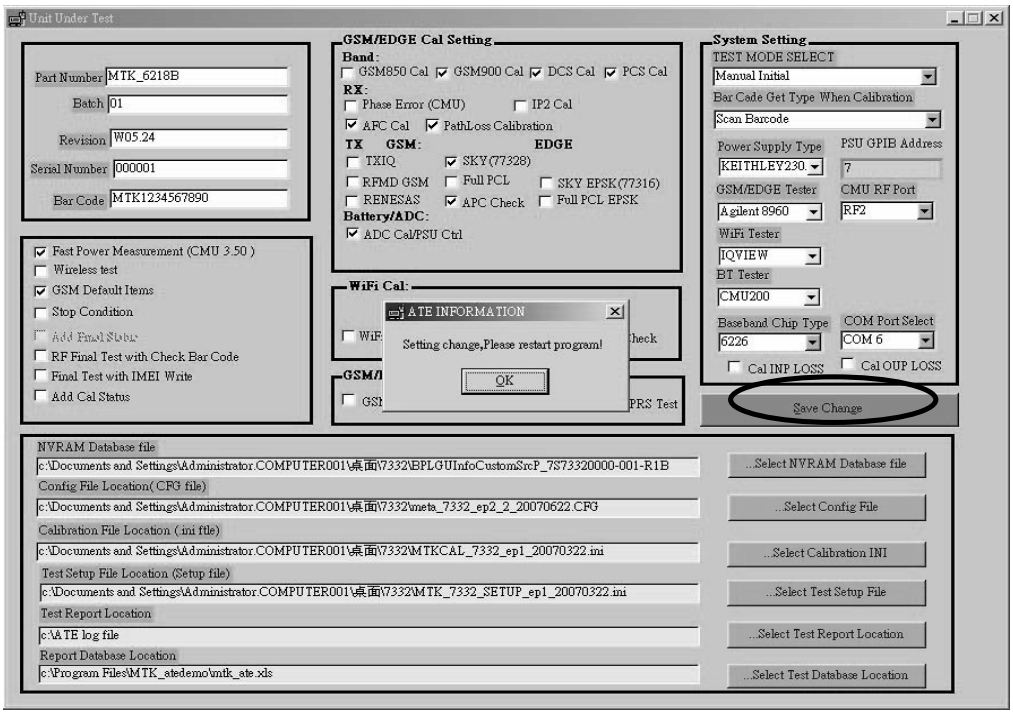
Press “Done”



Setup finish

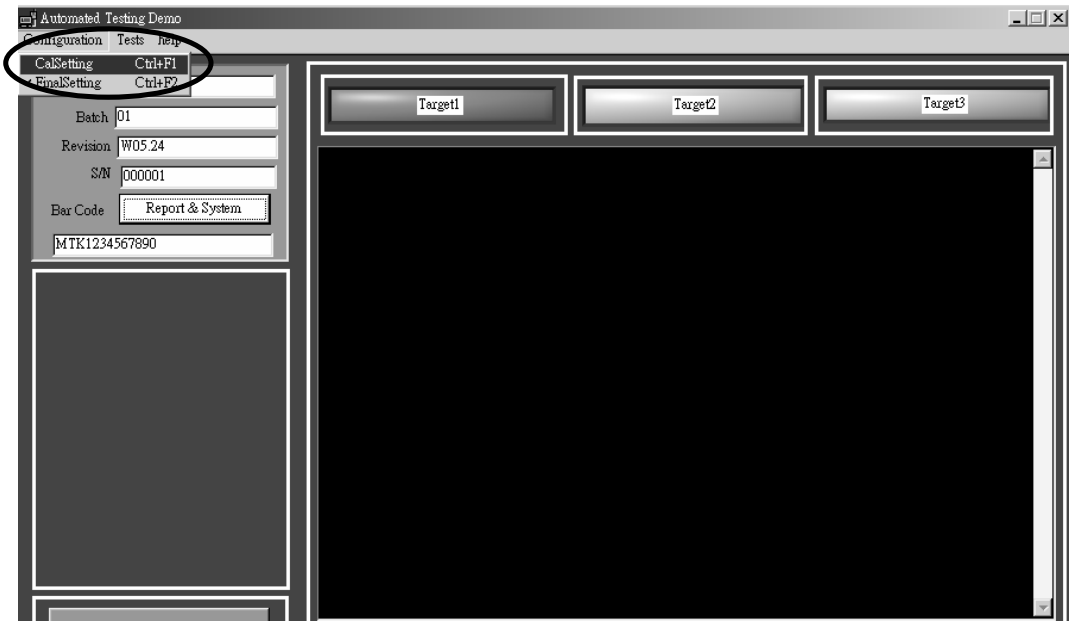


When you finish the setup then you press save change icon.

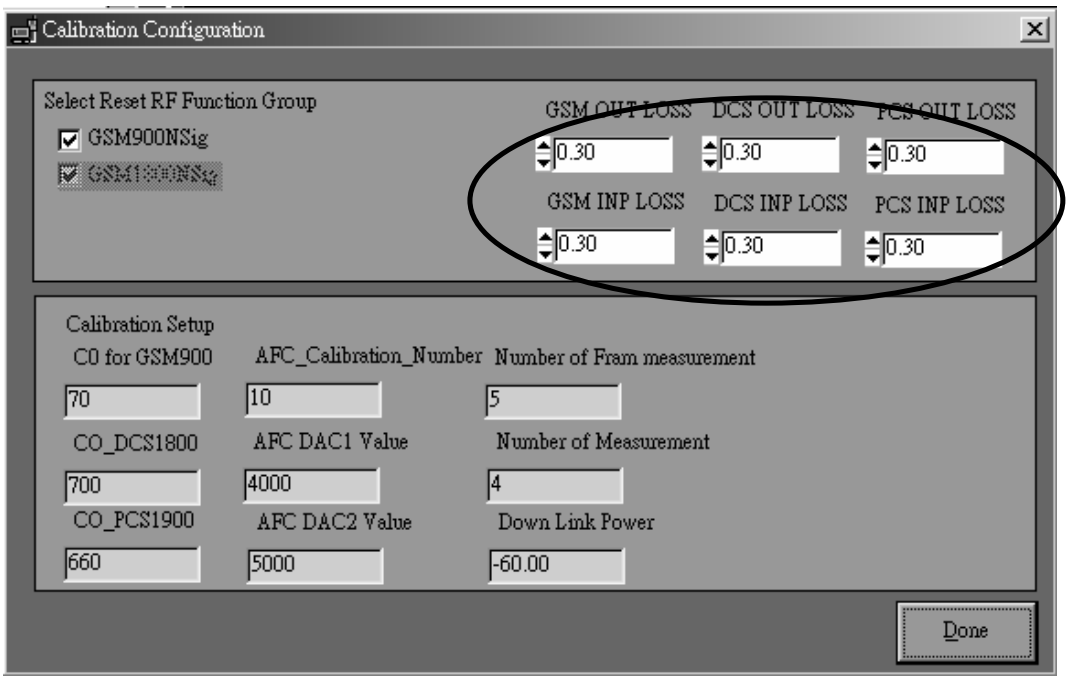


8. ATE TOOL

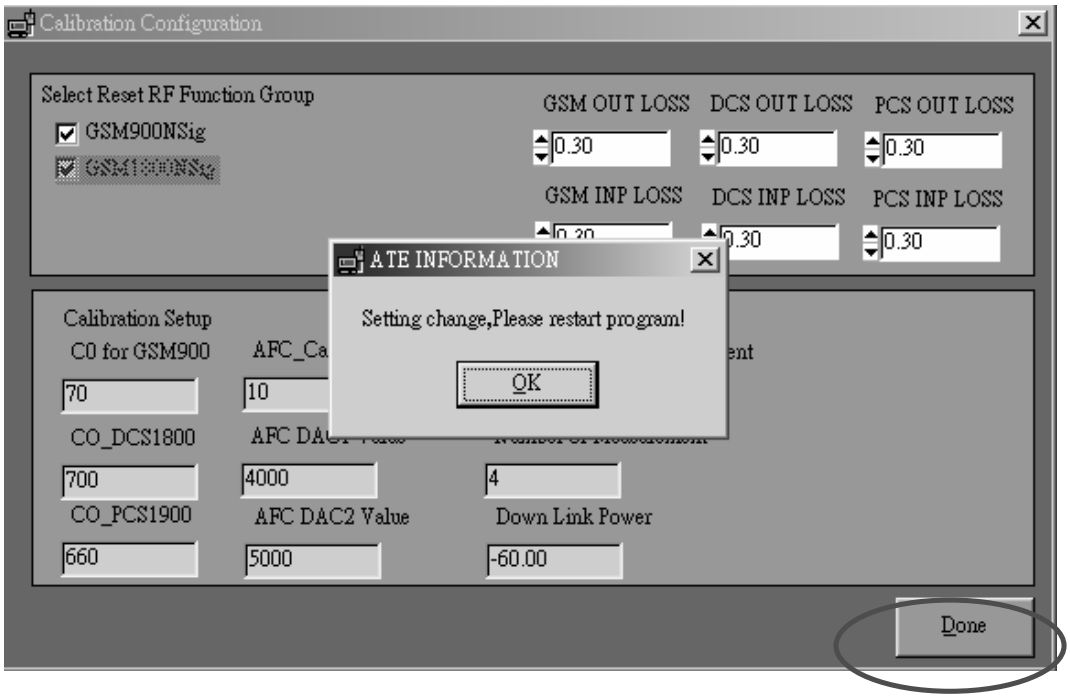
Press Configuration choose CalSetting



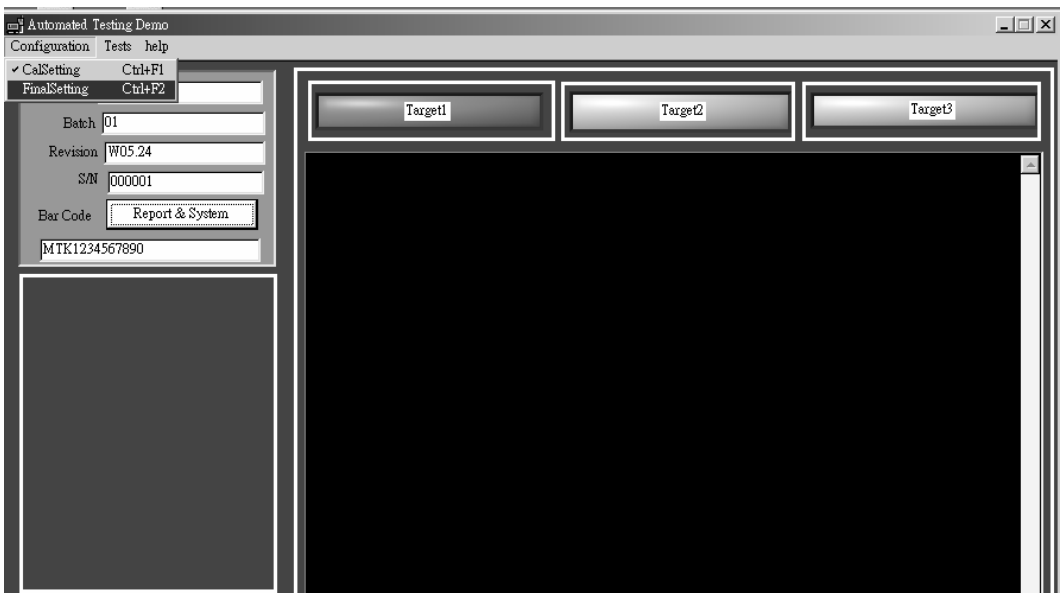
Setting your cable loss



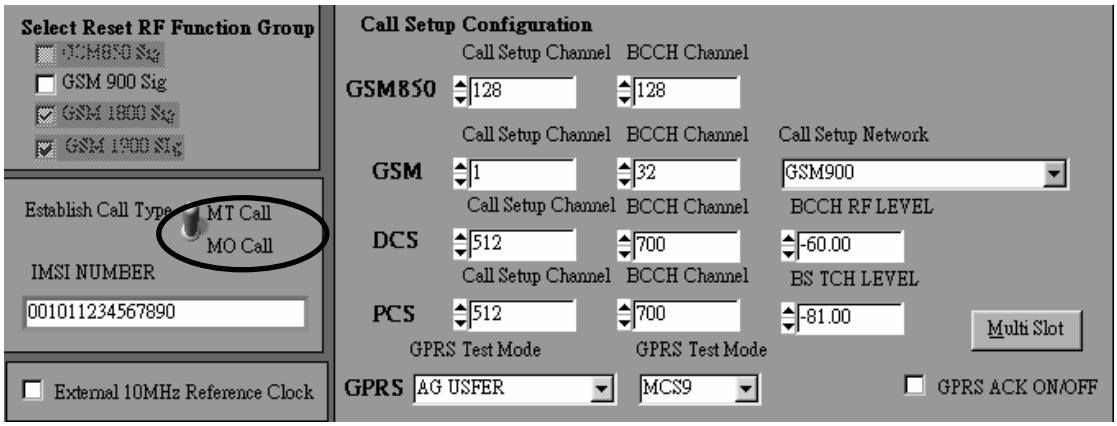
Press Dnoe to save



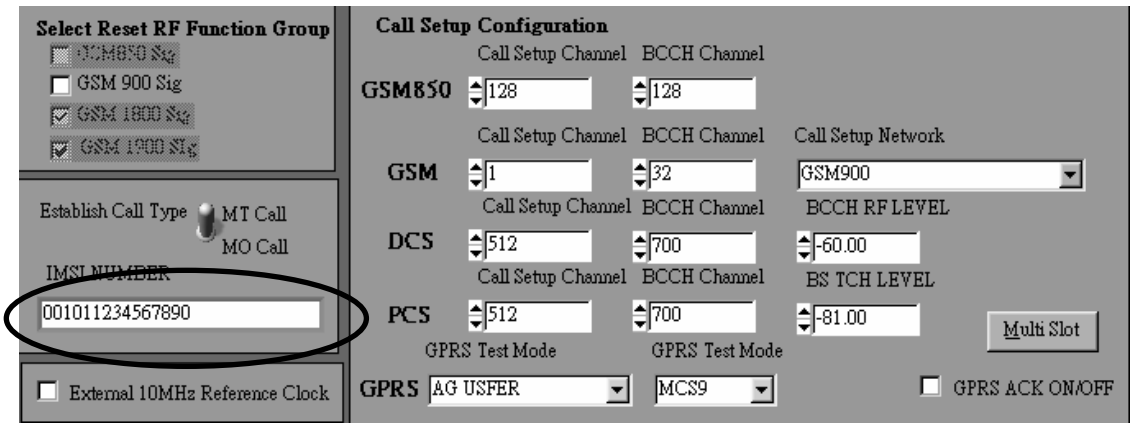
Press Configuration choose Finalsetting



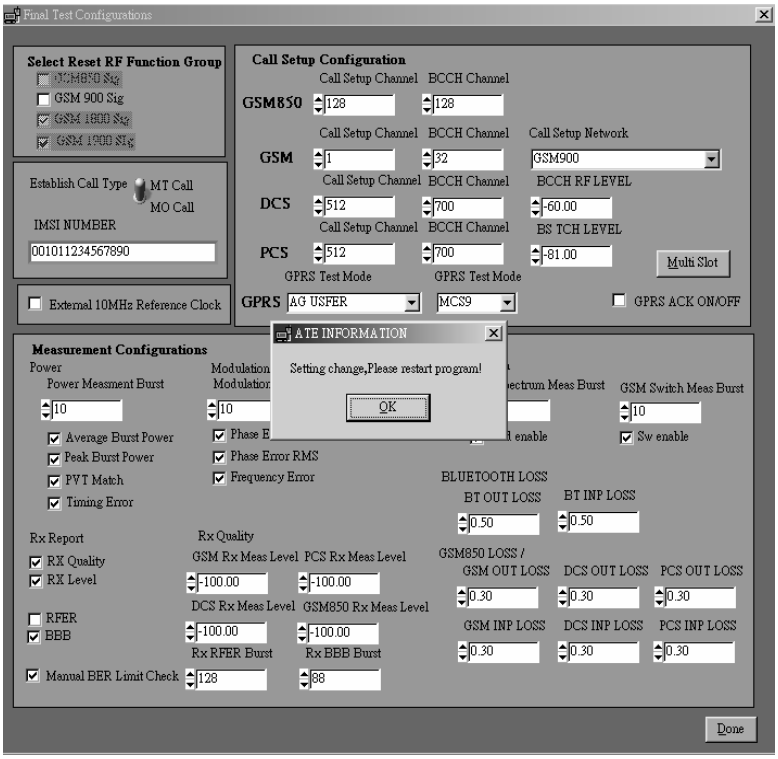
Choose “MT Call” from Establish Call Type



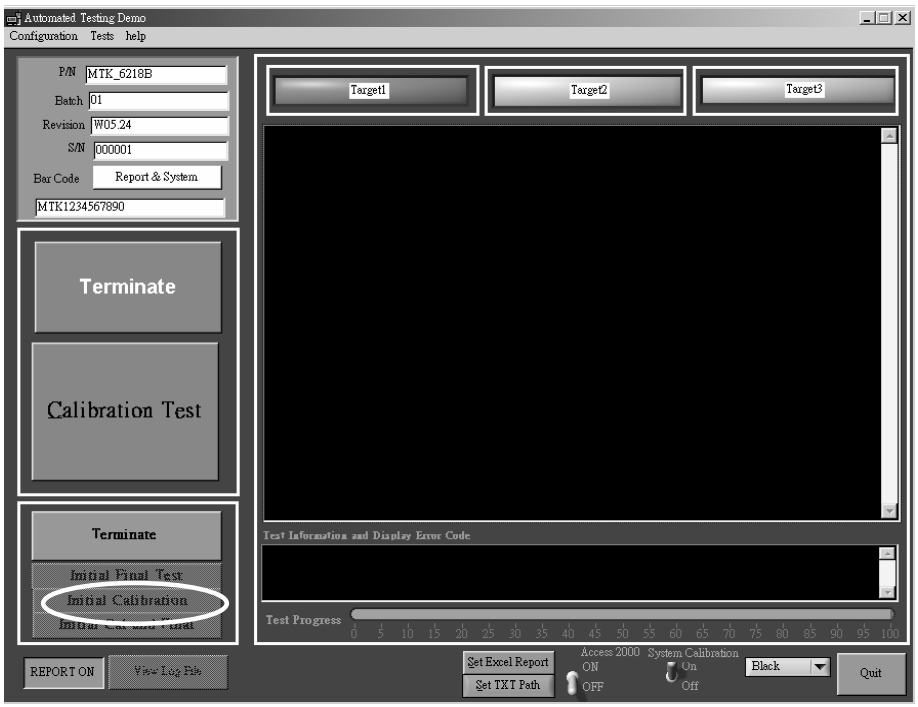
Keyin your test SIM card number form IMSI NUMBER



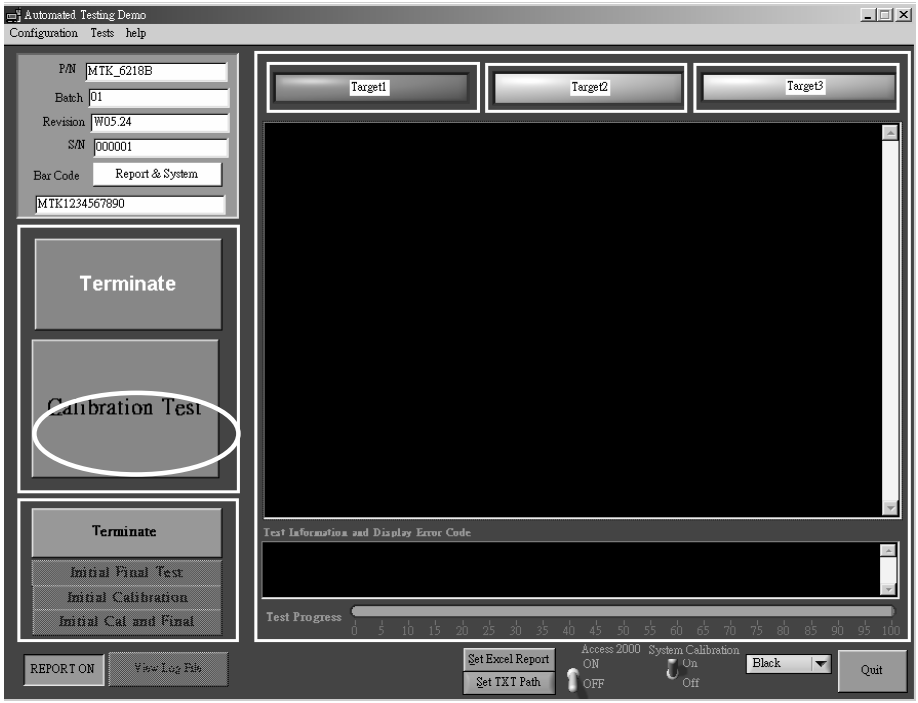
Press Done and save your setting



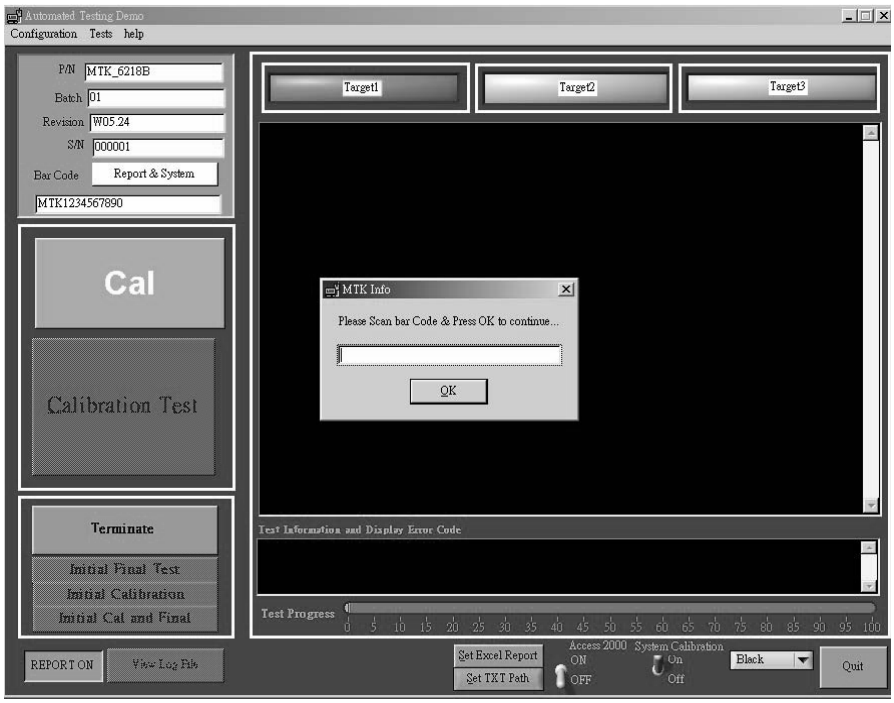
f you want calibration , you can press “initial calibration”



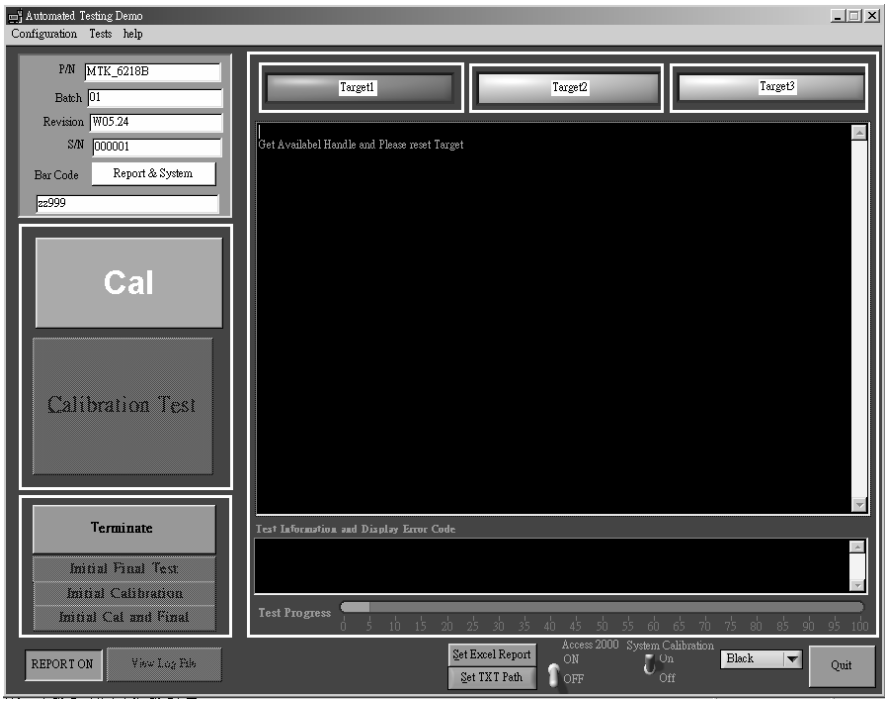
Press Calibration Test



Key-in your phone bar Code



Press your phone of power on key and Start calibration



Calibration is ok and will show “PASS”

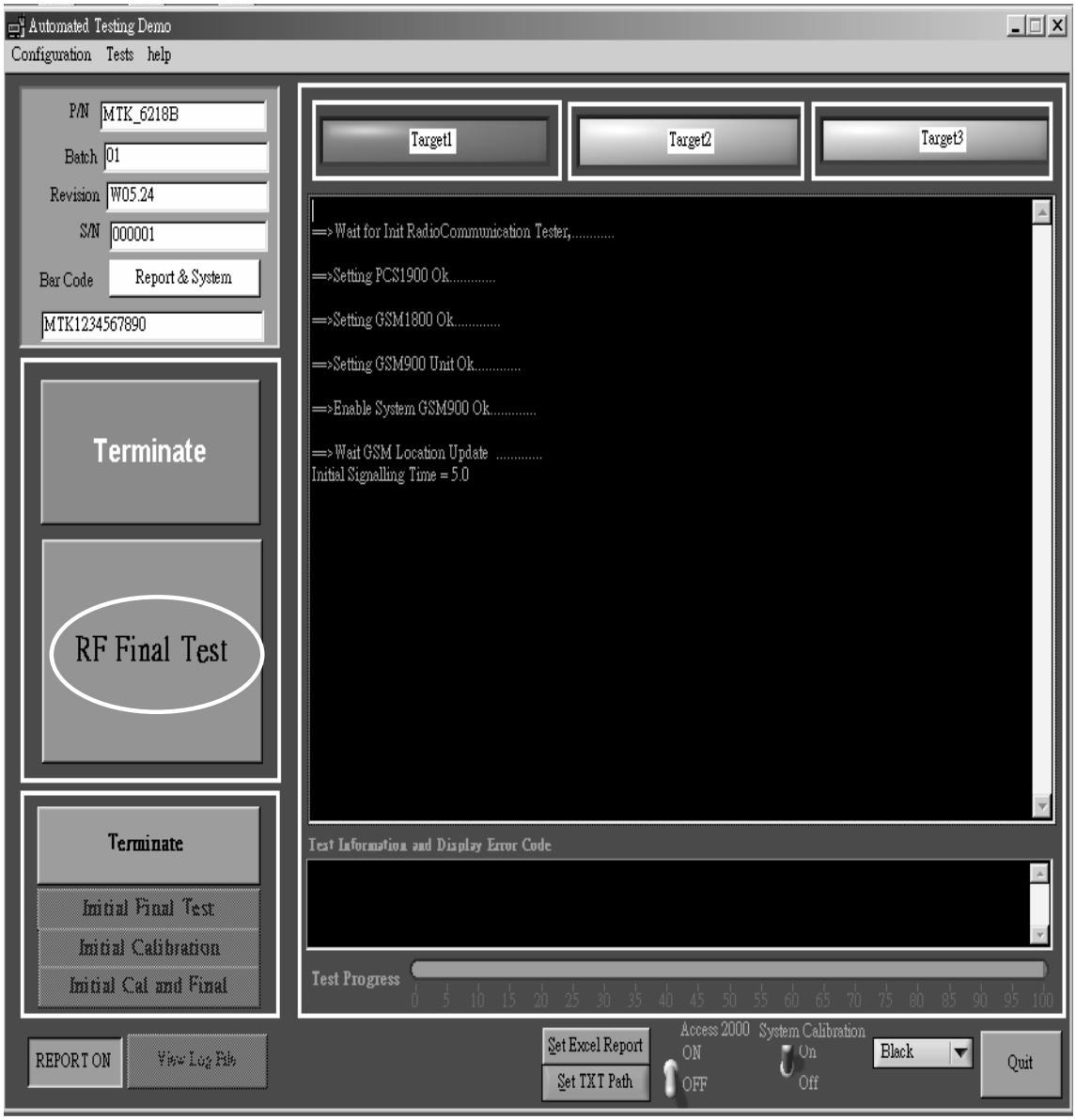
If you want see test report , you can press “View log file”

You can see the test report

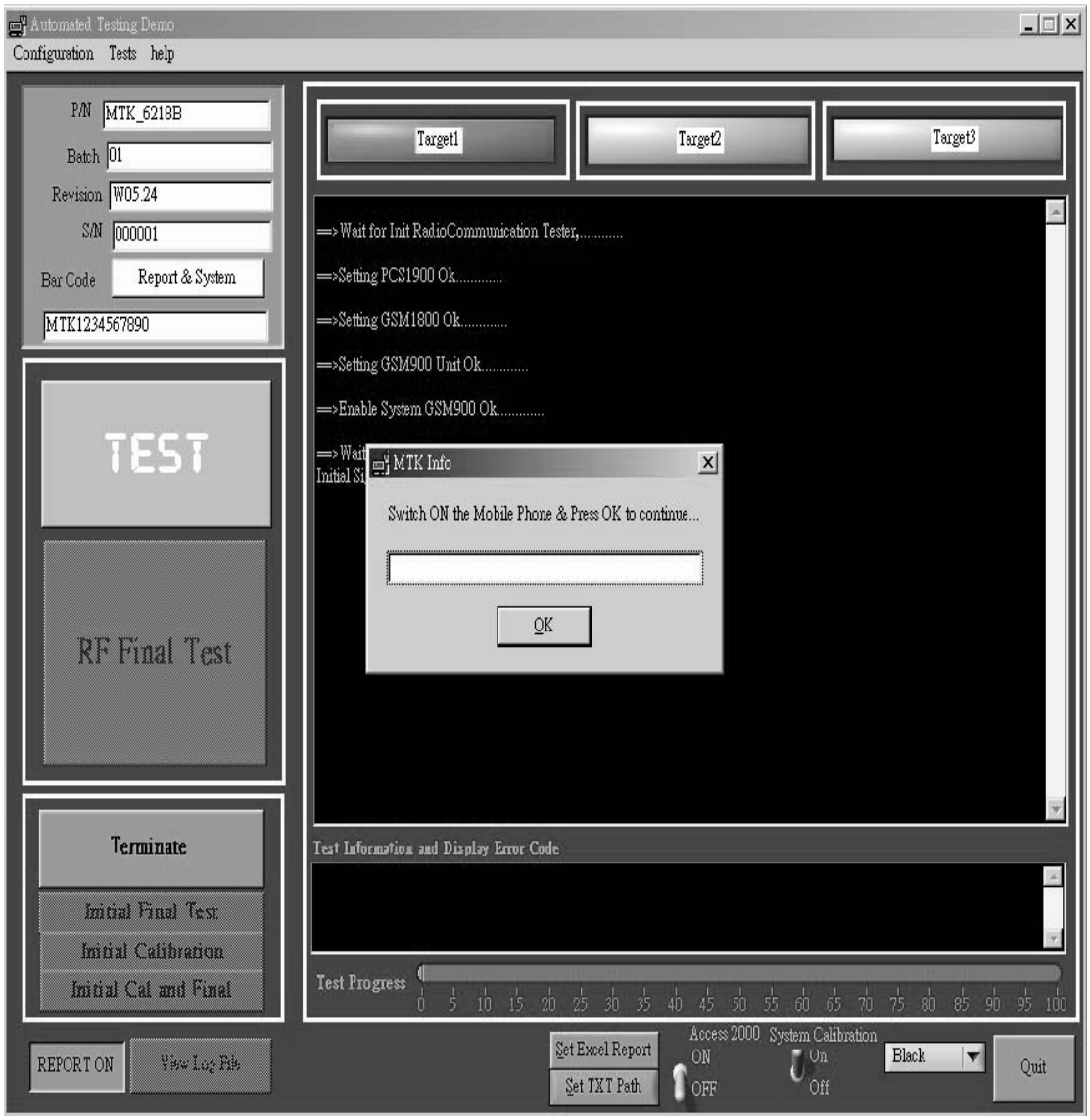
```
------------
 ATE Tool Version:5.0.3
 Part Number:  MTK_6218B
 Serial Number:  000001
 Revision:  W05.24
 Batch:  01
 Bar Code:  qqq
Error Code:  000
------------


        ==>Wait GSM Location Update  ..............
         Enter into META Mode OK
        AFC Calibration OK
Slope=2.824,min:1.000,max:10.000
Use Default Value=3836
        AFC Calibration time=1.64(sec)
PL GSM TCH 15 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 30 = 1.00  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 45 = 0.88  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 60 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 75 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 80 = 1.50  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 100 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 124 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 975 = 1.50  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 1000 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 1023 = 1.00  Pass MAX:3.00   MIN:-3.00
PL DCS TCH 550 = 0.50  Pass MAX:3.00   MIN:-3.00
PL DCS TCH 590 = 1.00  Pass MAX:3.00   MIN:-3.00
```

If you want final test , you can press “initial final test “

Press “RF Final test”

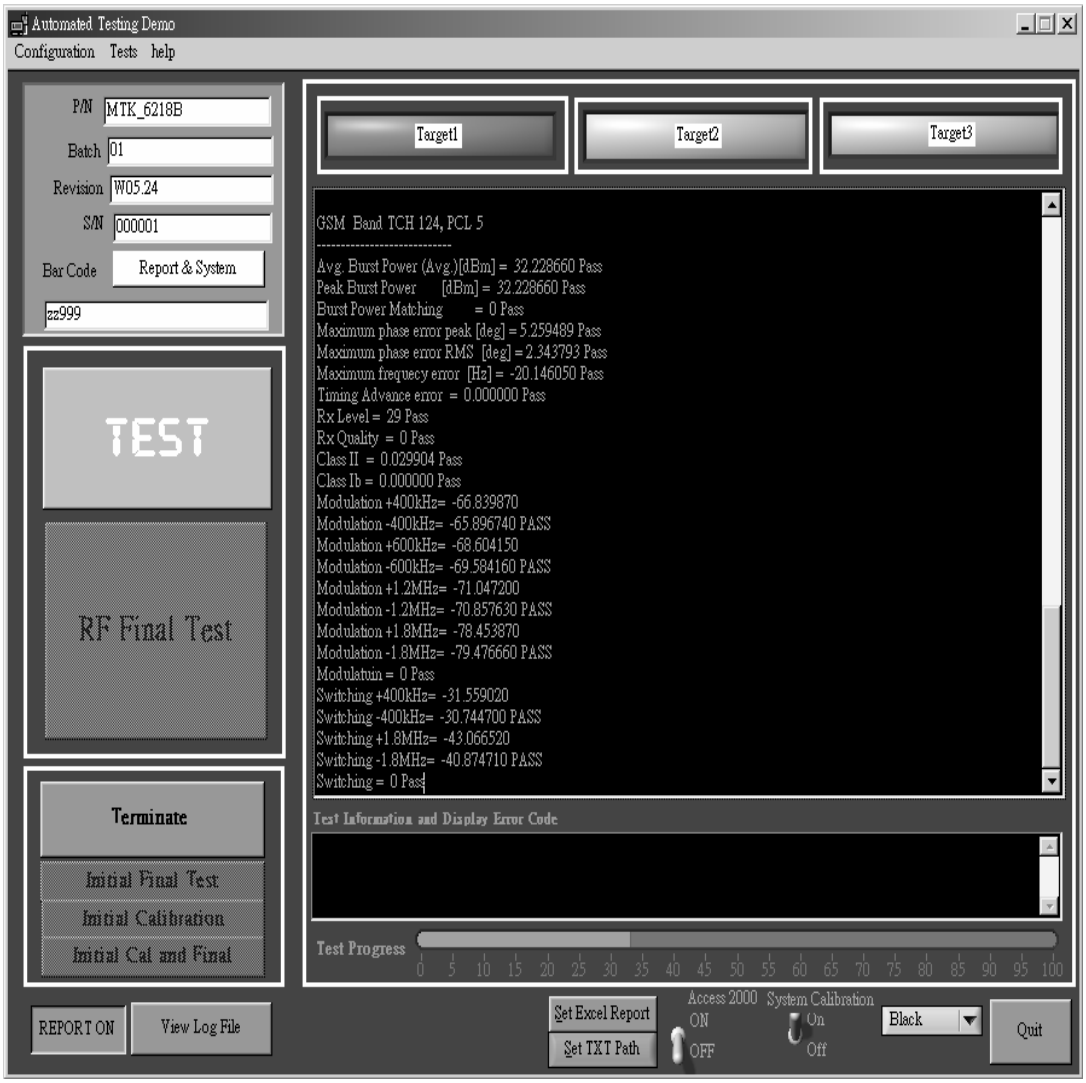


1. Handset to insert sim card
2. Key-in bar code or IMEI number
3. power on handset

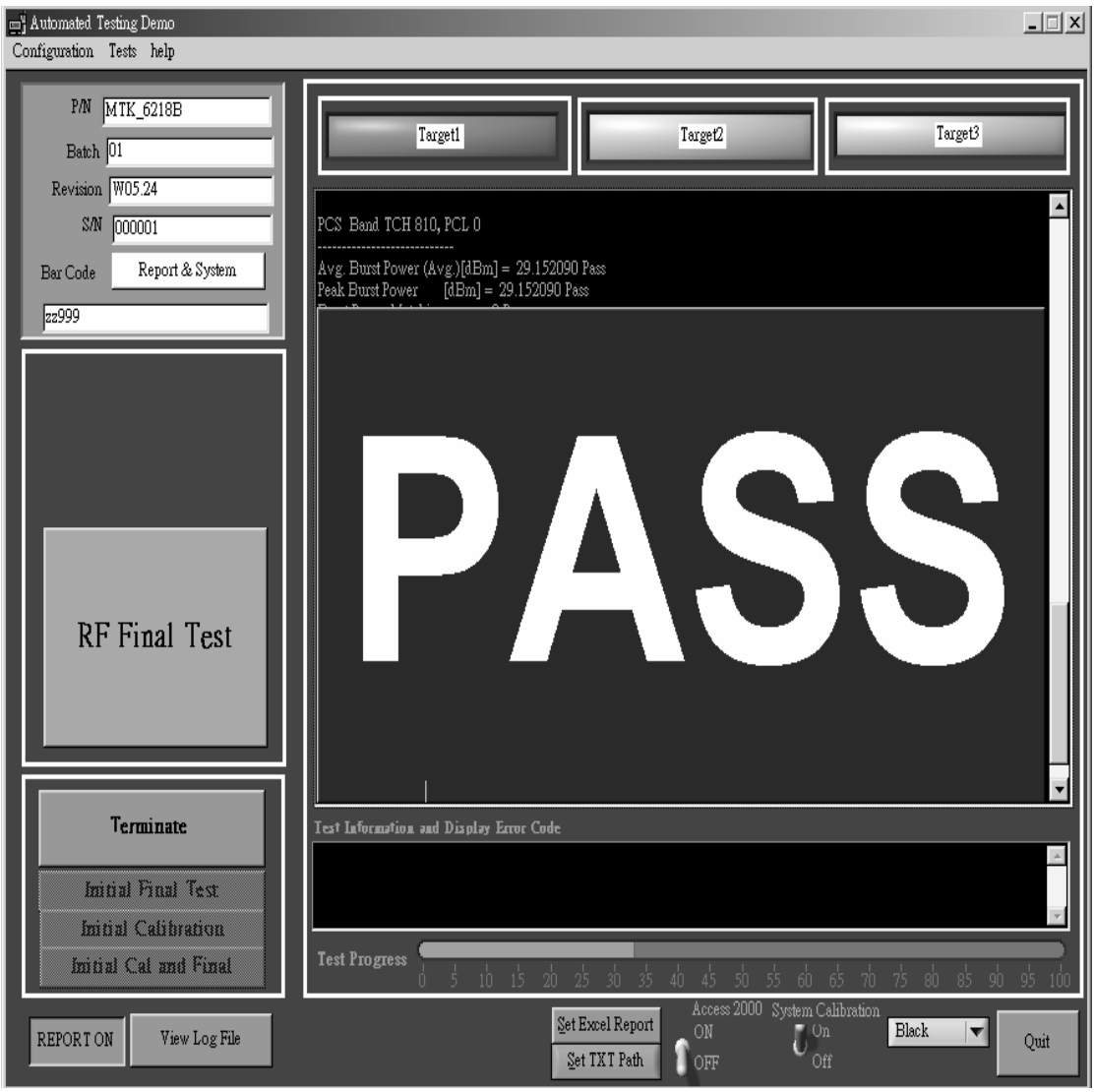


8. ATE TOOL

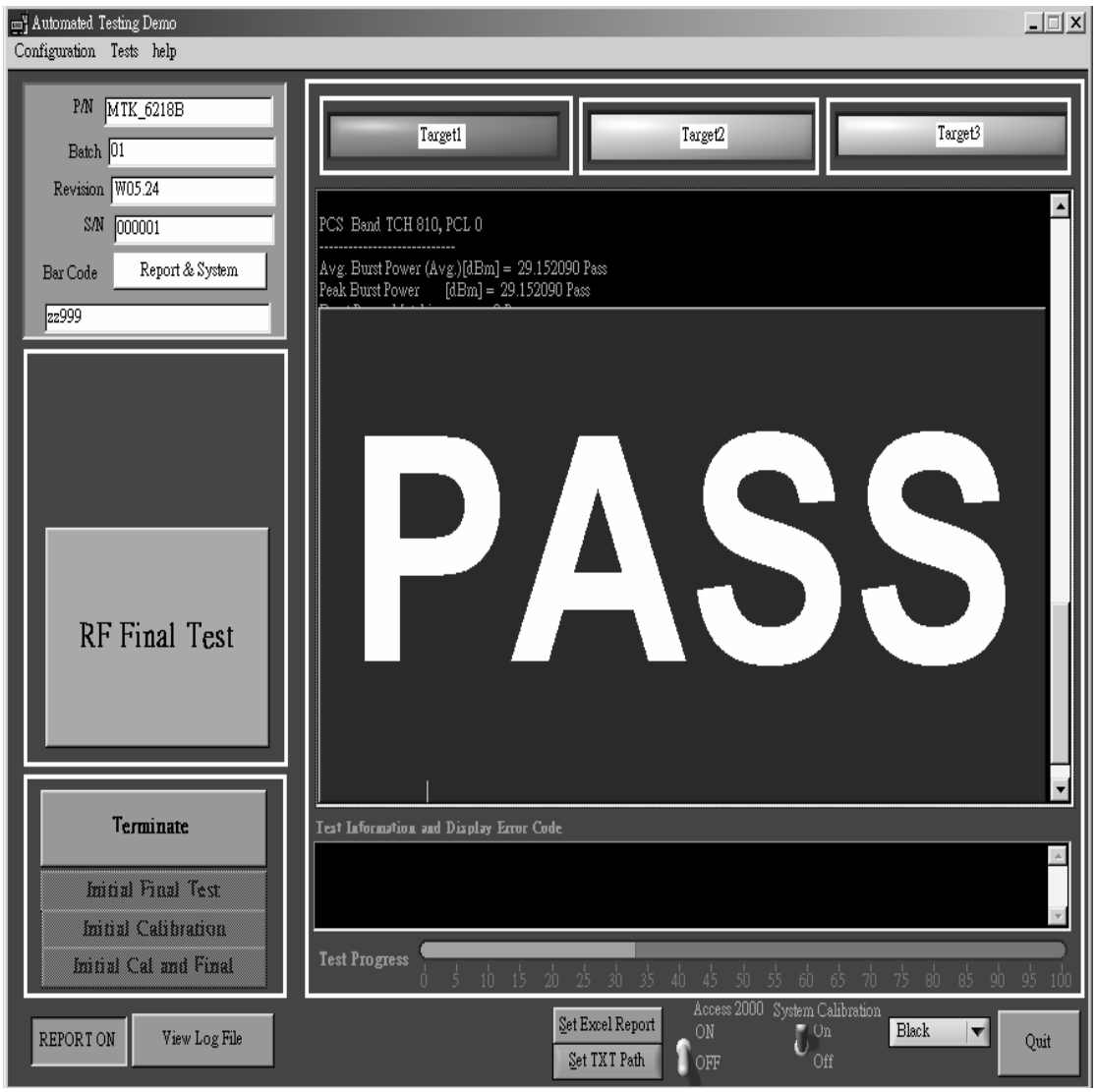
ATE start final test



If ATE test finish , ATE will show pass



If you want see the test report , you can press “View Log File”



You can see the test report

```
------------
 ATE Tool Version:5.0.3
 Part Number:  MTK_6218B
 Serial Number:  000001
 Revision:  W05.24
 Batch:  01
 Bar Code:  qqq
Error Code:  000
------------


        ==>Wait GSM Location Update  ..............
         Enter into META Mode OK
        AFC Calibration OK
Slope=2.824,min:1.000,max:10.000
Use Default Value=3836
        AFC Calibration time=1.64(sec)
PL GSM TCH 15 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 30 = 1.00  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 45 = 0.88  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 60 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 75 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 80 = 1.50  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 100 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 124 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 975 = 1.50  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 1000 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 1023 = 1.00  Pass MAX:3.00   MIN:-3.00
PL DCS TCH 550 = 0.50  Pass MAX:3.00   MIN:-3.00
PL DCS TCH 590 = 1.00  Pass MAX:3.00   MIN:-3.00
```

8. ATE TOOL

If you want initial cal and final test , you can press “initial cal and final test”

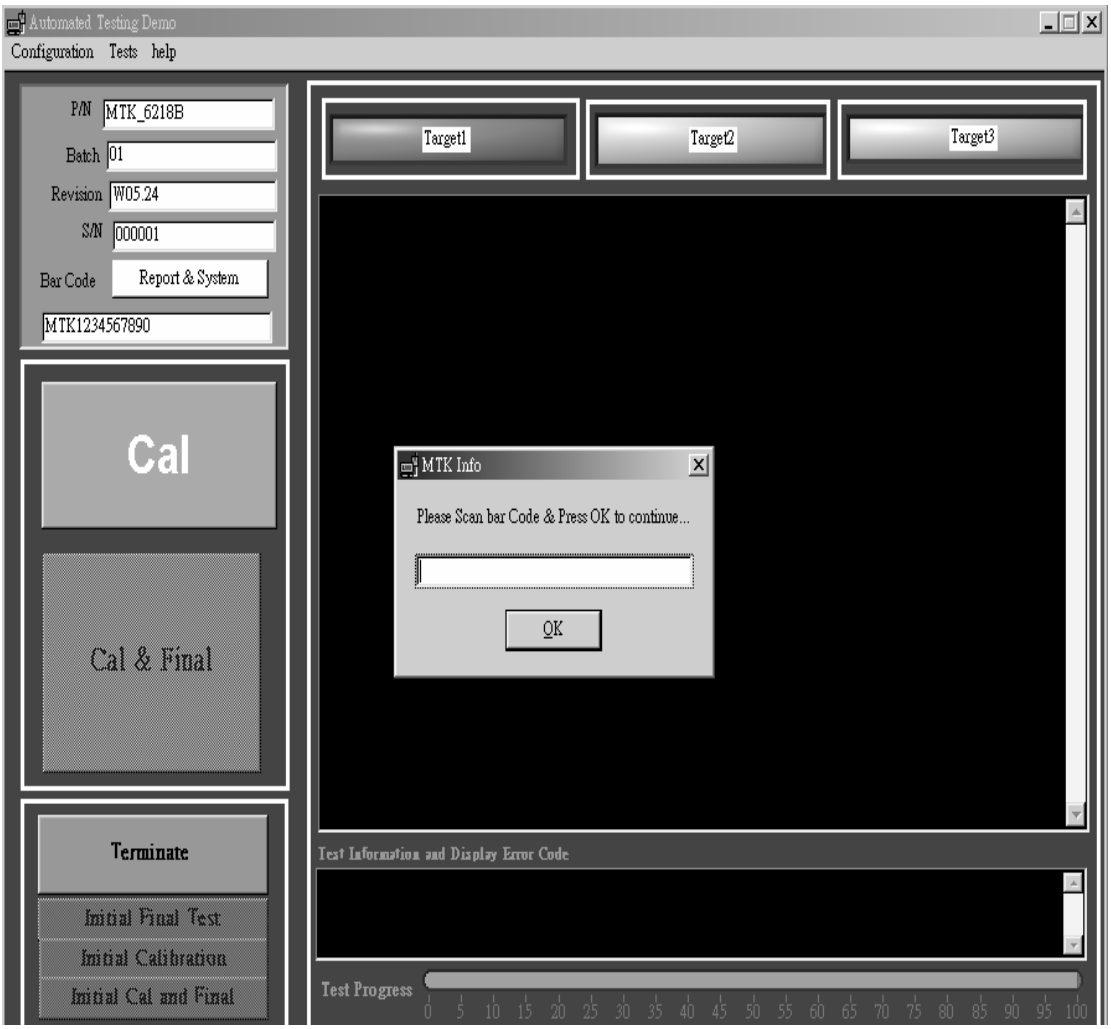
Press “Cal & Final”

8. ATE TOOL

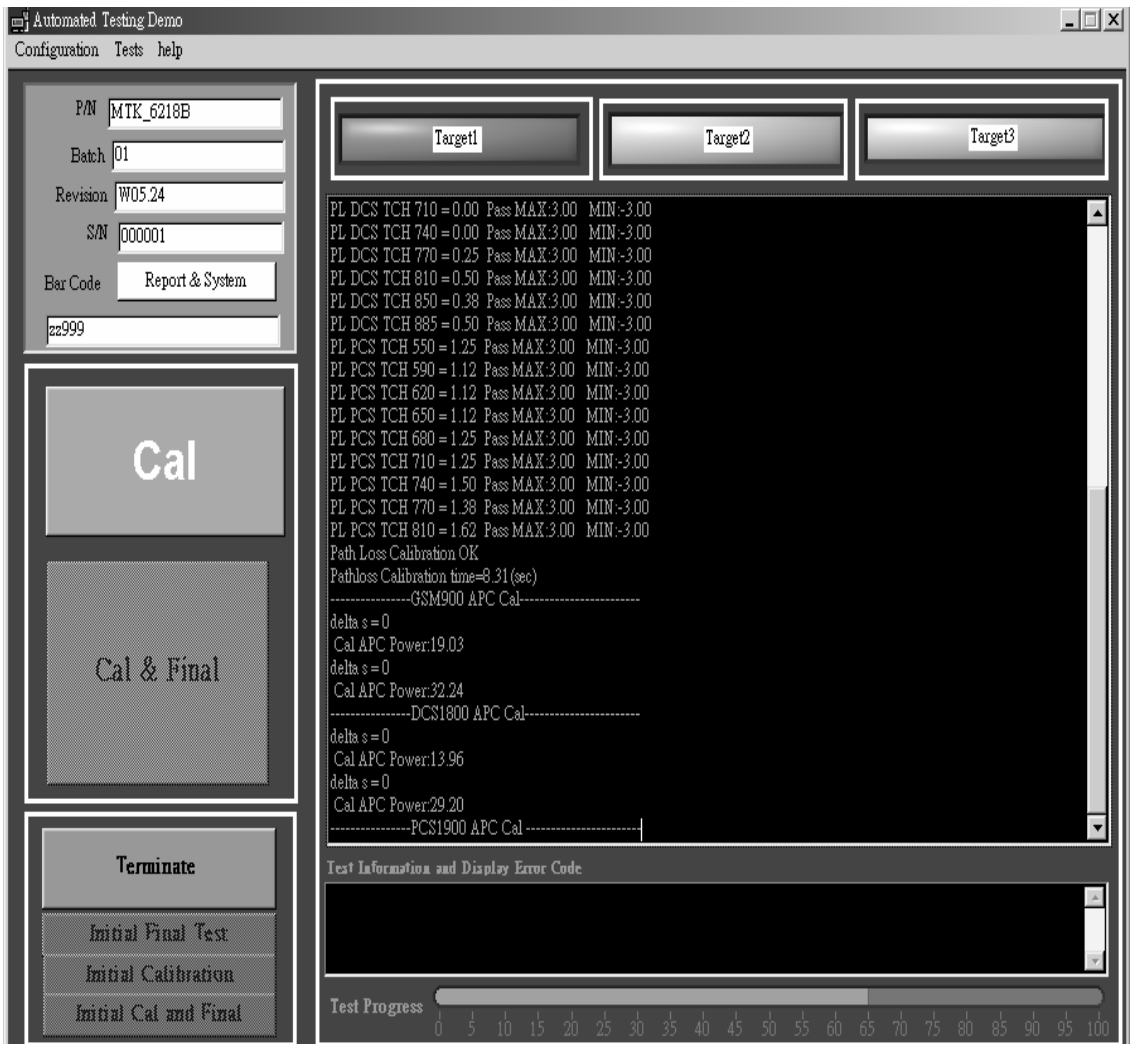
1.Handset to insert sim card

2.Key-in bar code or IMEI number

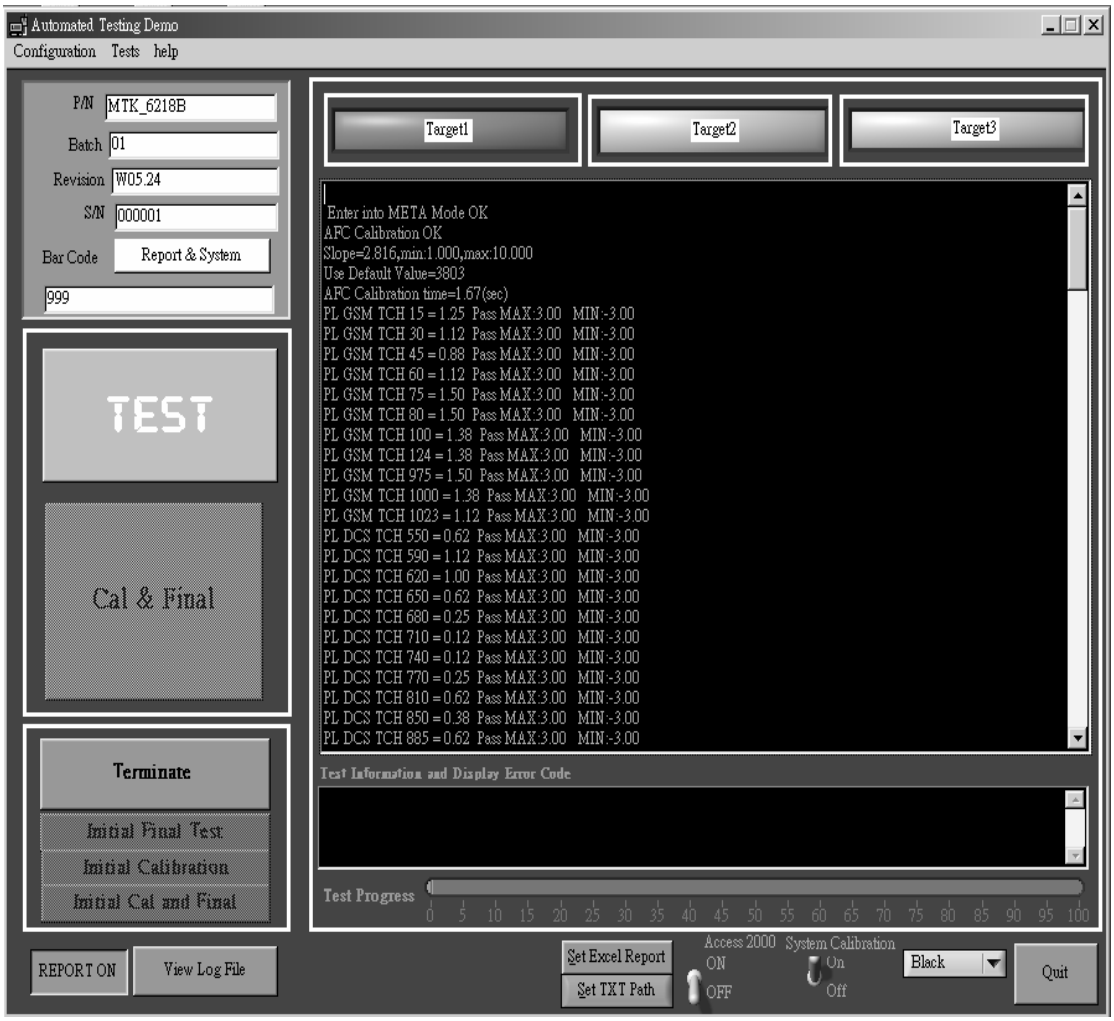
3.Power on handset



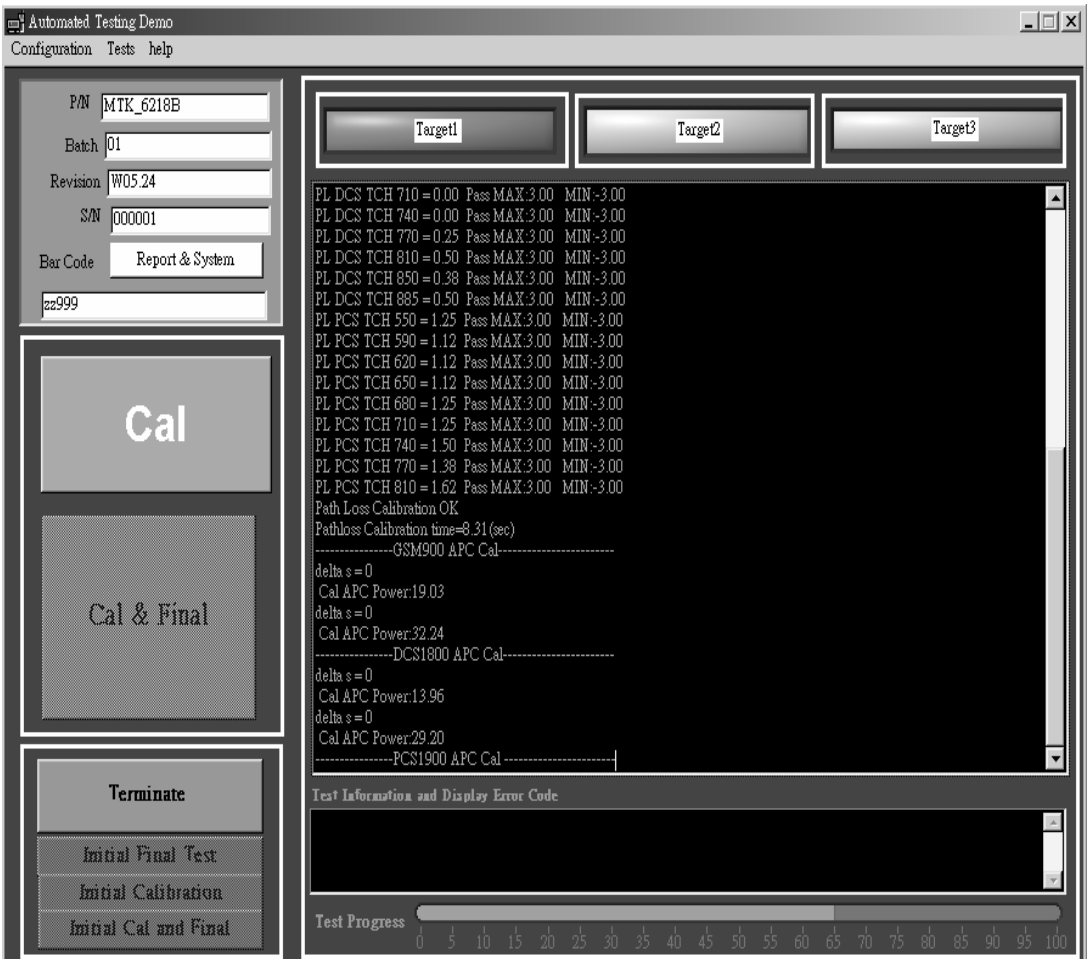
Start calibration



Calibration finish and power on handset again



Start final test

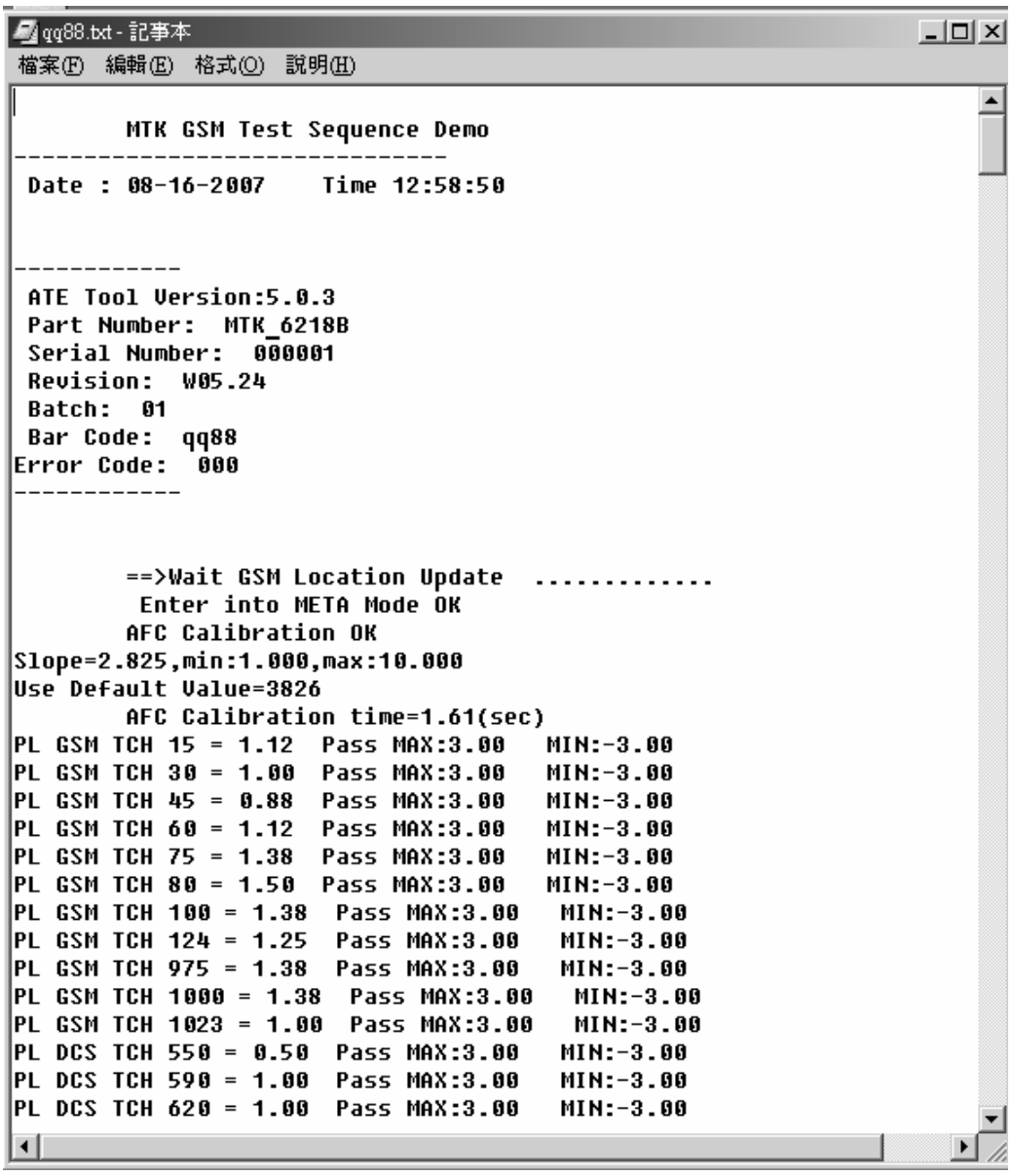


Finish “Cal & Final test”

If you want see the report , you can press “View Log File”

8. ATE TOOL

Ate show the test report



qq88.txt - 記事本

檔案(F) 編輯(E) 格式(O) 說明(H)

```
        MTK GSM Test Sequence Demo
-------------------------------
 Date : 08-16-2007    Time 12:58:50


------------
 ATE Tool Version:5.0.3
 Part Number:  MTK_6218B
 Serial Number:  000001
 Revision:  W05.24
 Batch:  01
 Bar Code:  qq88
Error Code:  000
------------


        ==>Wait GSM Location Update  ..............
         Enter into META Mode OK
        AFC Calibration OK
Slope=2.825,min:1.000,max:10.000
Use Default Value=3826
        AFC Calibration time=1.61(sec)
PL GSM TCH 15 = 1.12  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 30 = 1.00  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 45 = 0.88  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 60 = 1.12  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 75 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 80 = 1.50  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 100 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 124 = 1.25  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 975 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 1000 = 1.38  Pass MAX:3.00   MIN:-3.00
PL GSM TCH 1023 = 1.00  Pass MAX:3.00   MIN:-3.00
PL DCS TCH 550 = 0.50  Pass MAX:3.00   MIN:-3.00
PL DCS TCH 590 = 1.00  Pass MAX:3.00   MIN:-3.00
PL DCS TCH 620 = 1.00  Pass MAX:3.00   MIN:-3.00
```

Section 9

Swoftware Download Procedure

9. Swoftware Download Procedure

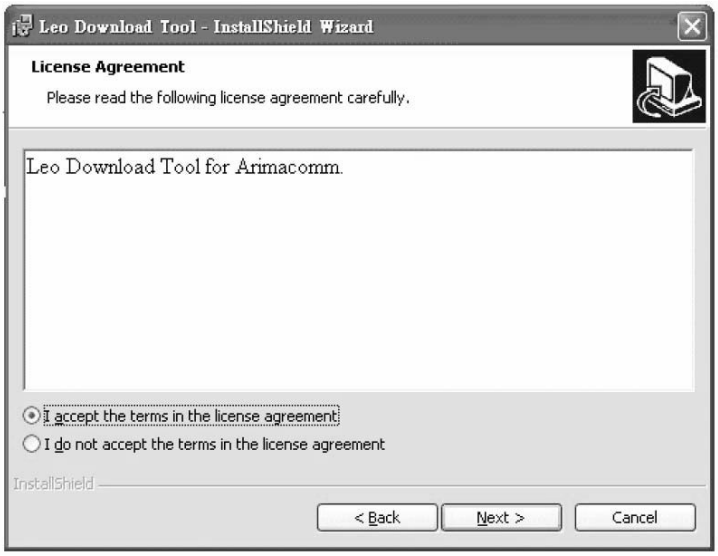
LEO Download Tool

Tools

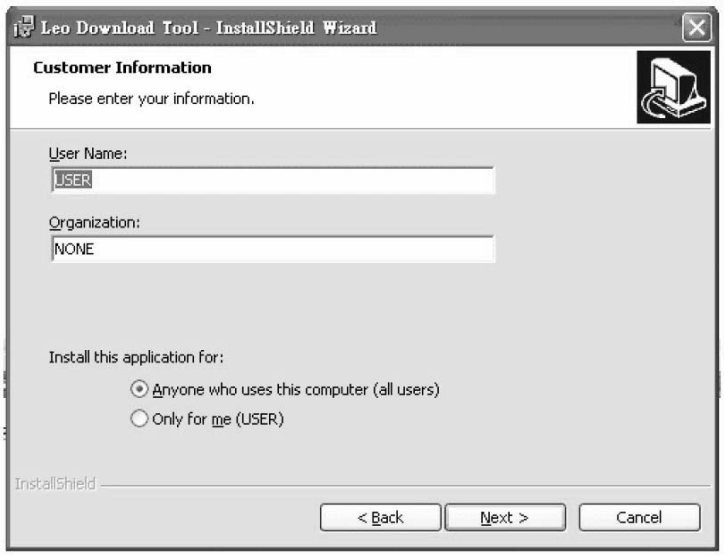
1. Download cable
2. PC
3. Battery (3.8 V Li-ion Battery)

How to user Leo download tool

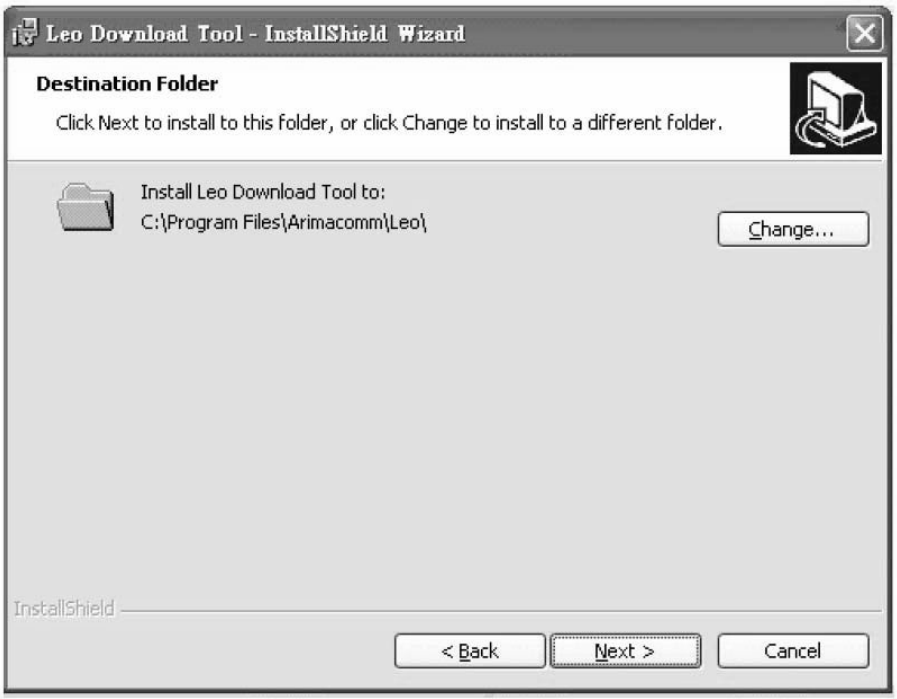
9.1 Install Leo Download tool



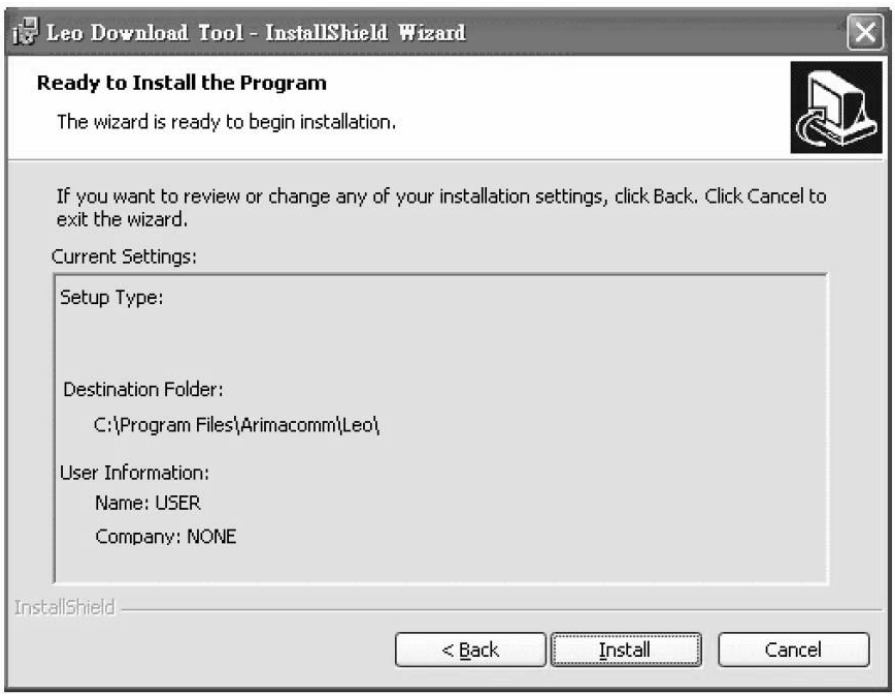
→ Choose I accept the terms in the license agreement



→ Type user name / organization. [You could type any anything or just follow it up]

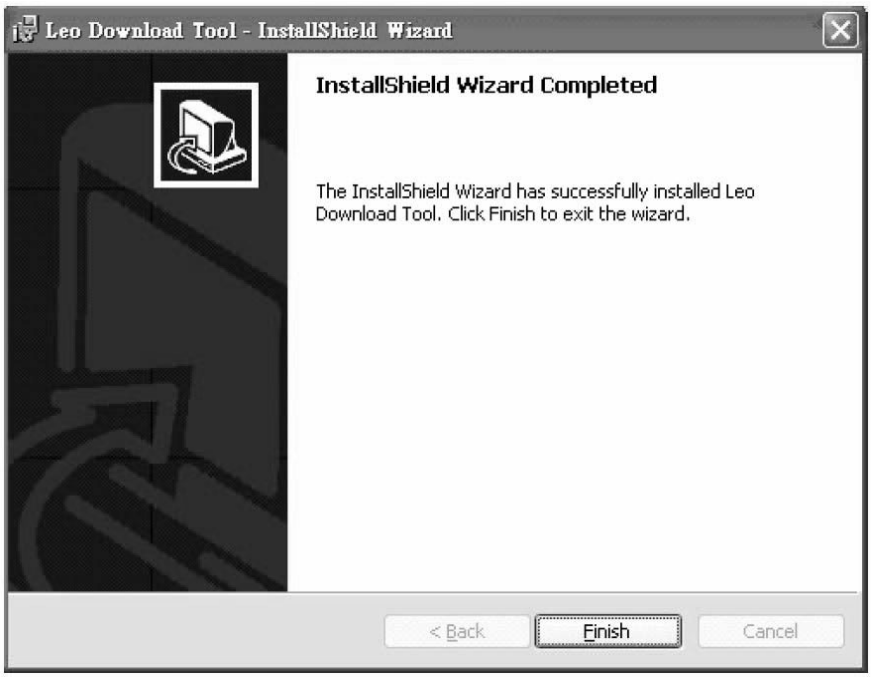


→ Select default folder

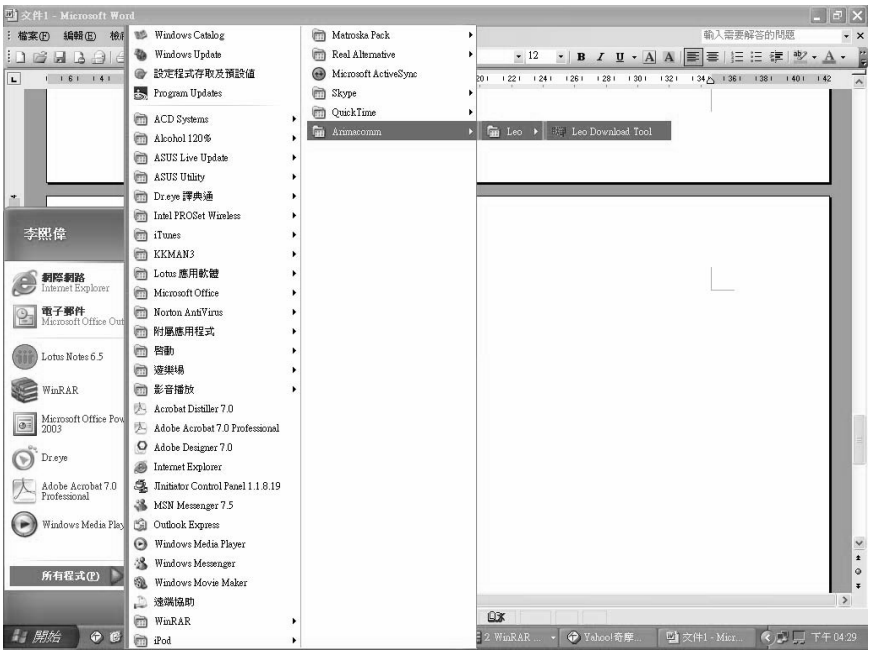


→ Press Install

9. Swoftware Download Procedure



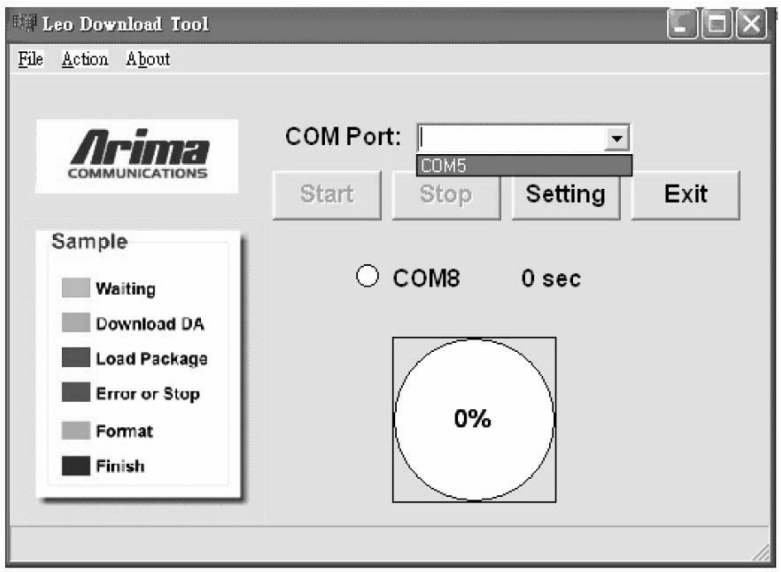
→ Press Finish



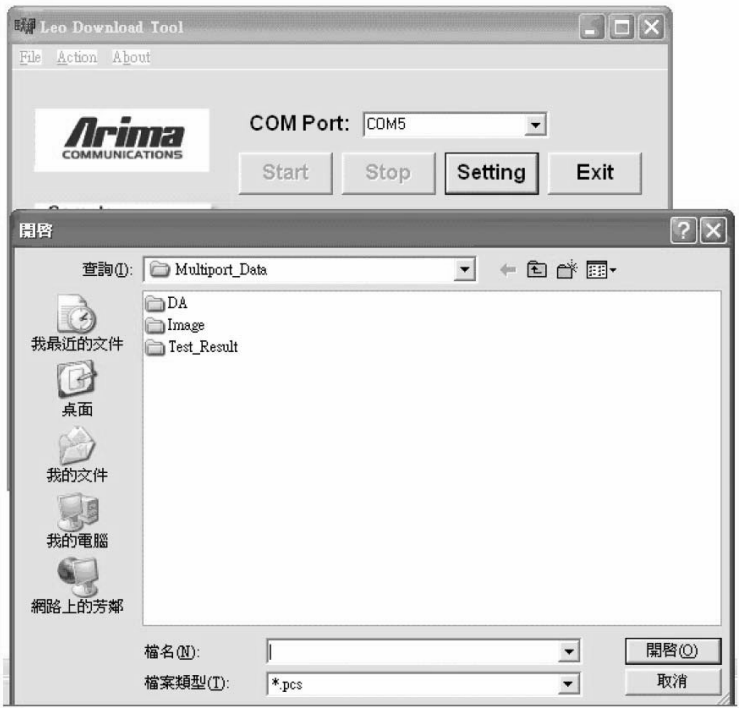
→ Enable Leo Download tool

9.2 Connect Download cable with computer and mobile

9.3 Install SW

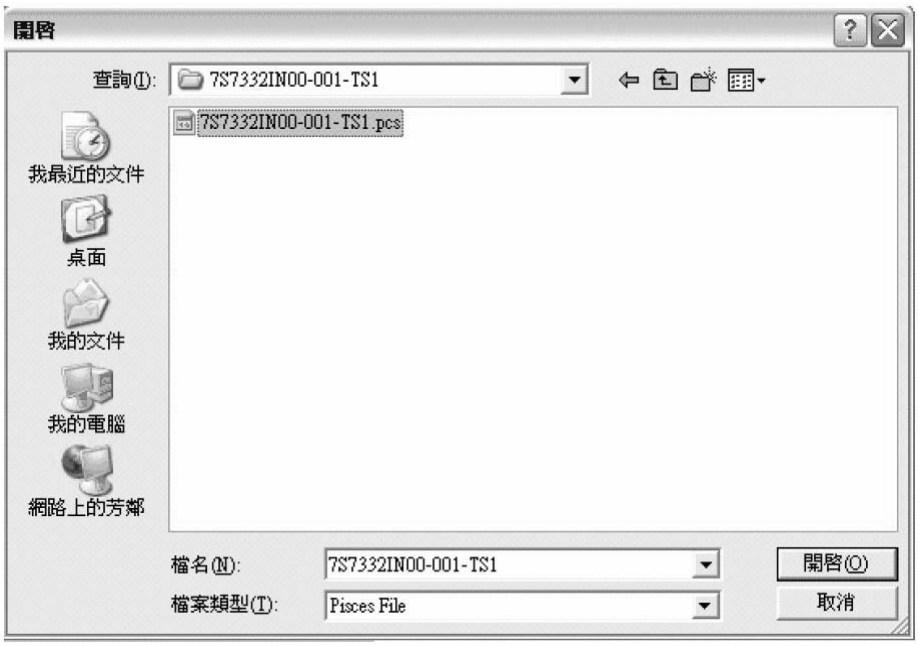


→ Select COM port (Maybe it will show different COM because of we use different computer)



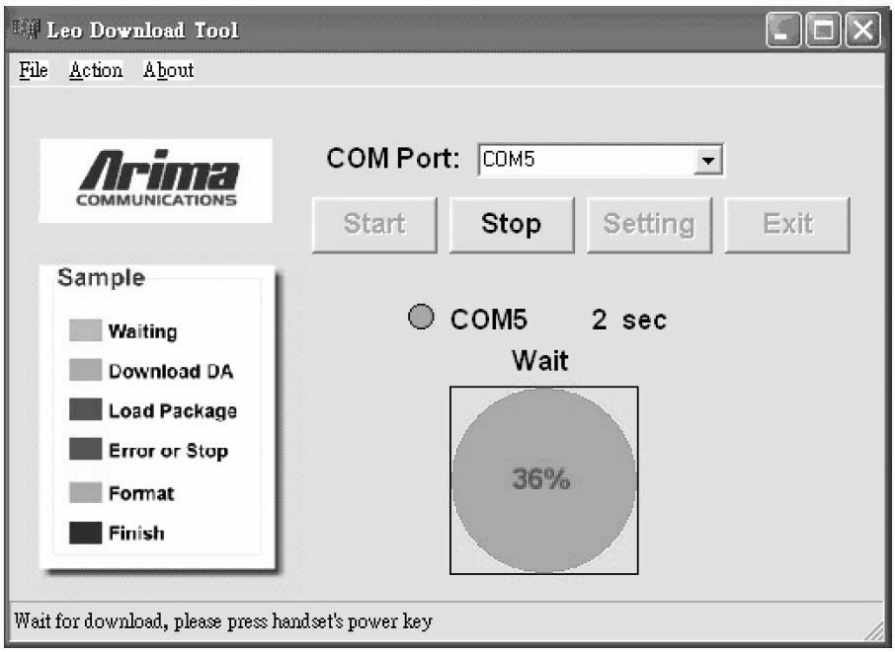
→ Press Setting and then you will see Multiport Data folder. Change it to the folder which you store the SW.

9. Swoftware Download Procedure

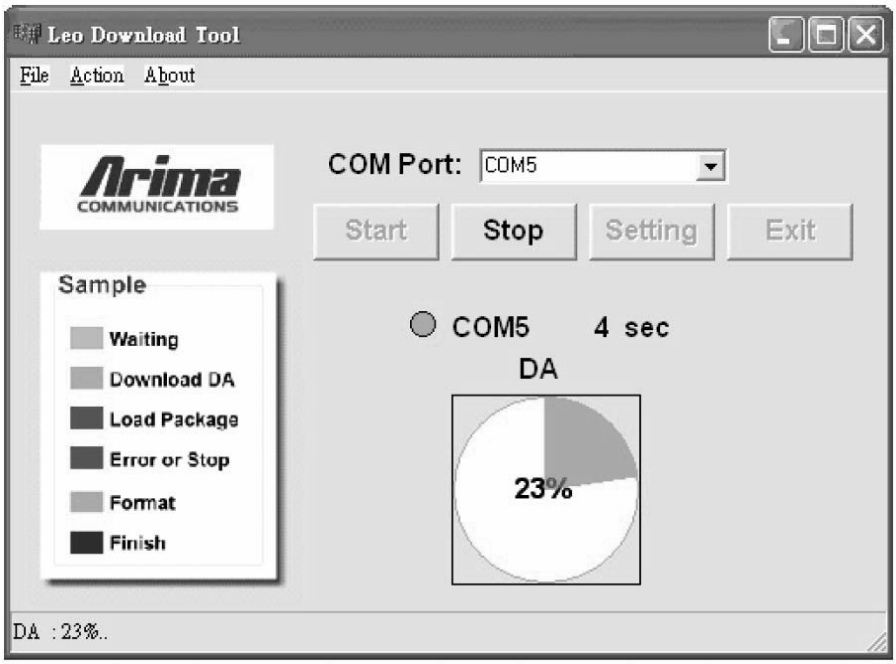


→ Select the. Pcs file and press open. After few seconds, you will see below screen.

→ Press Yes

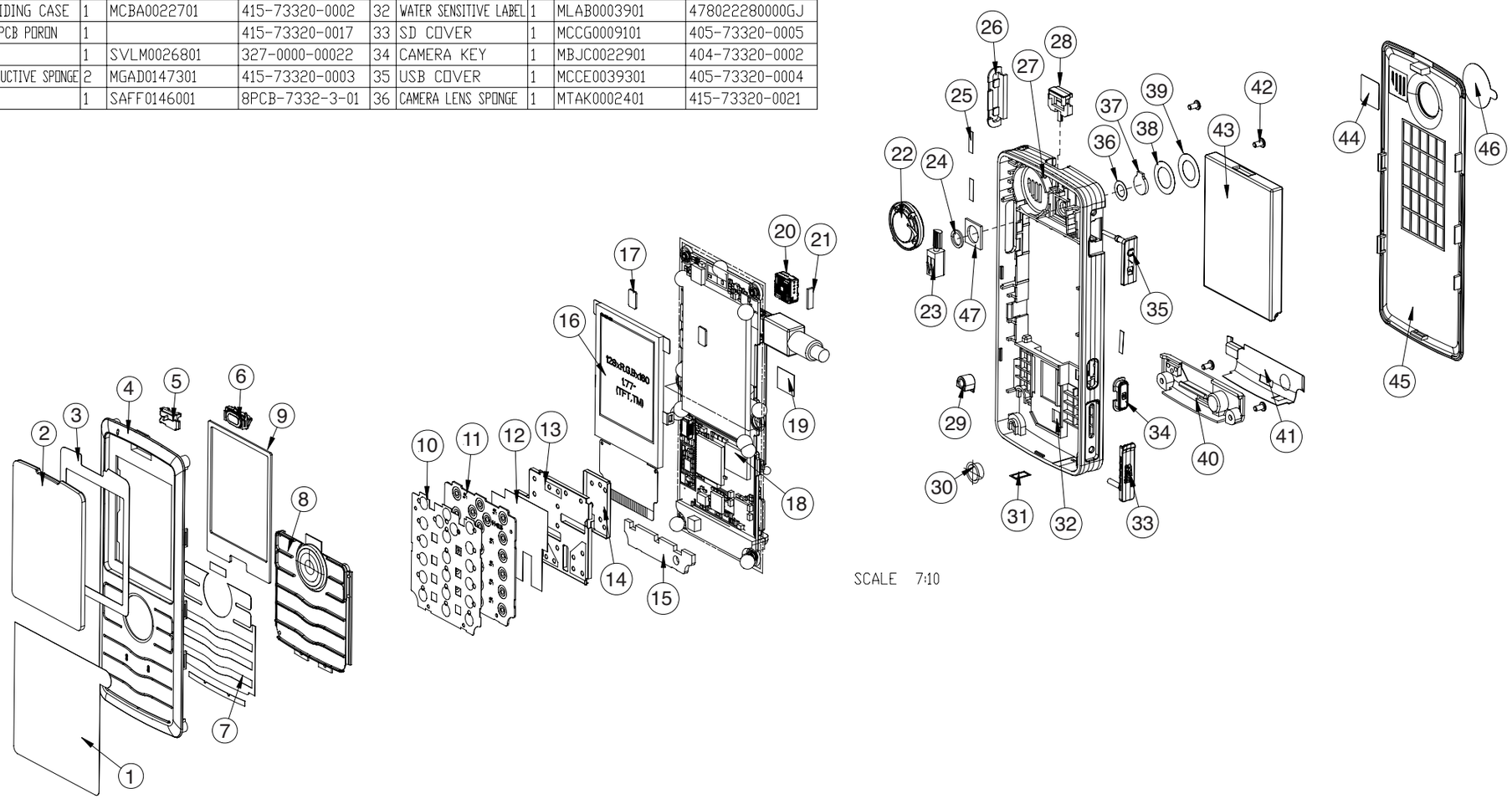


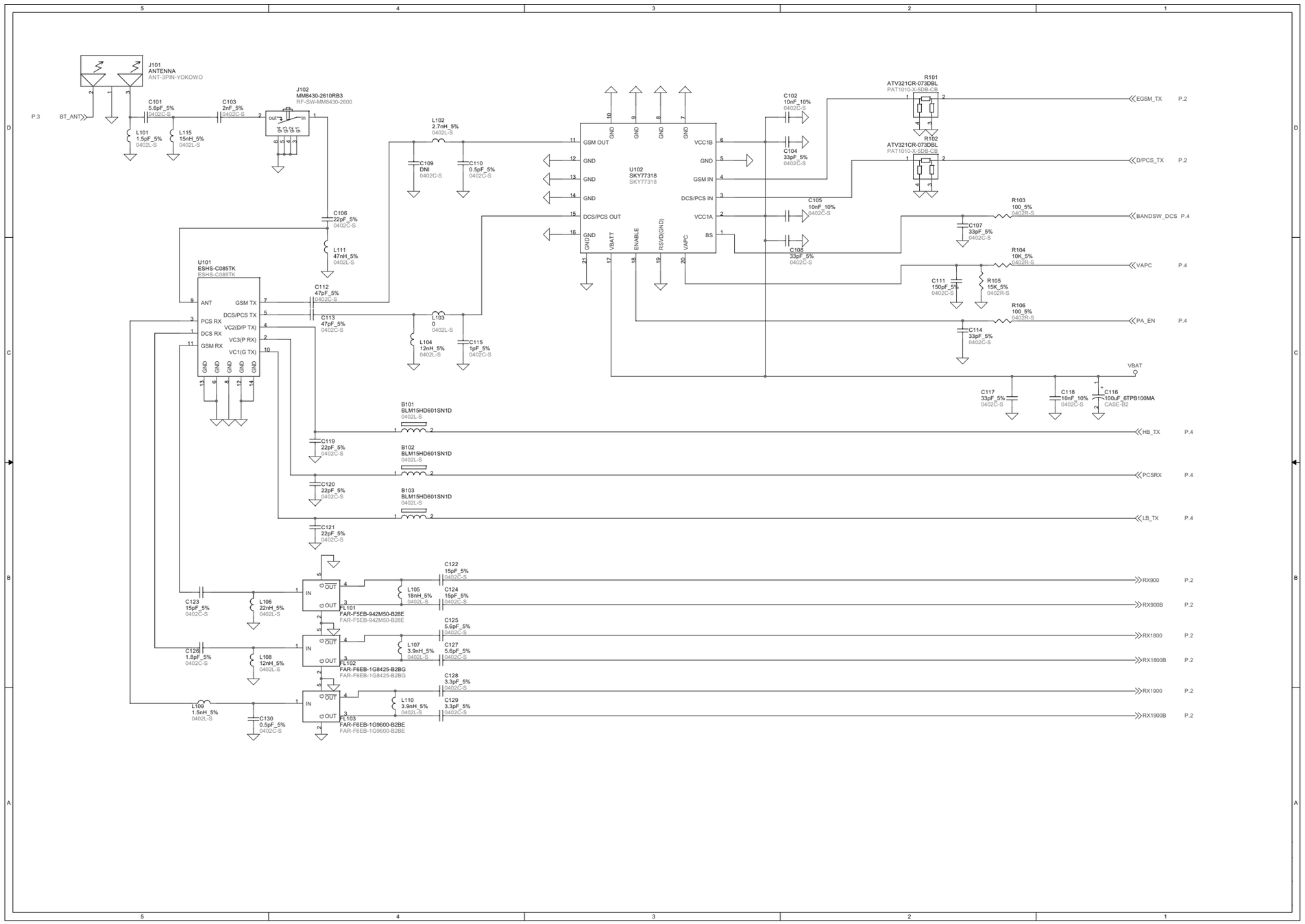
→ After you see the pink cycle, long press power on key and then you will see below picture.

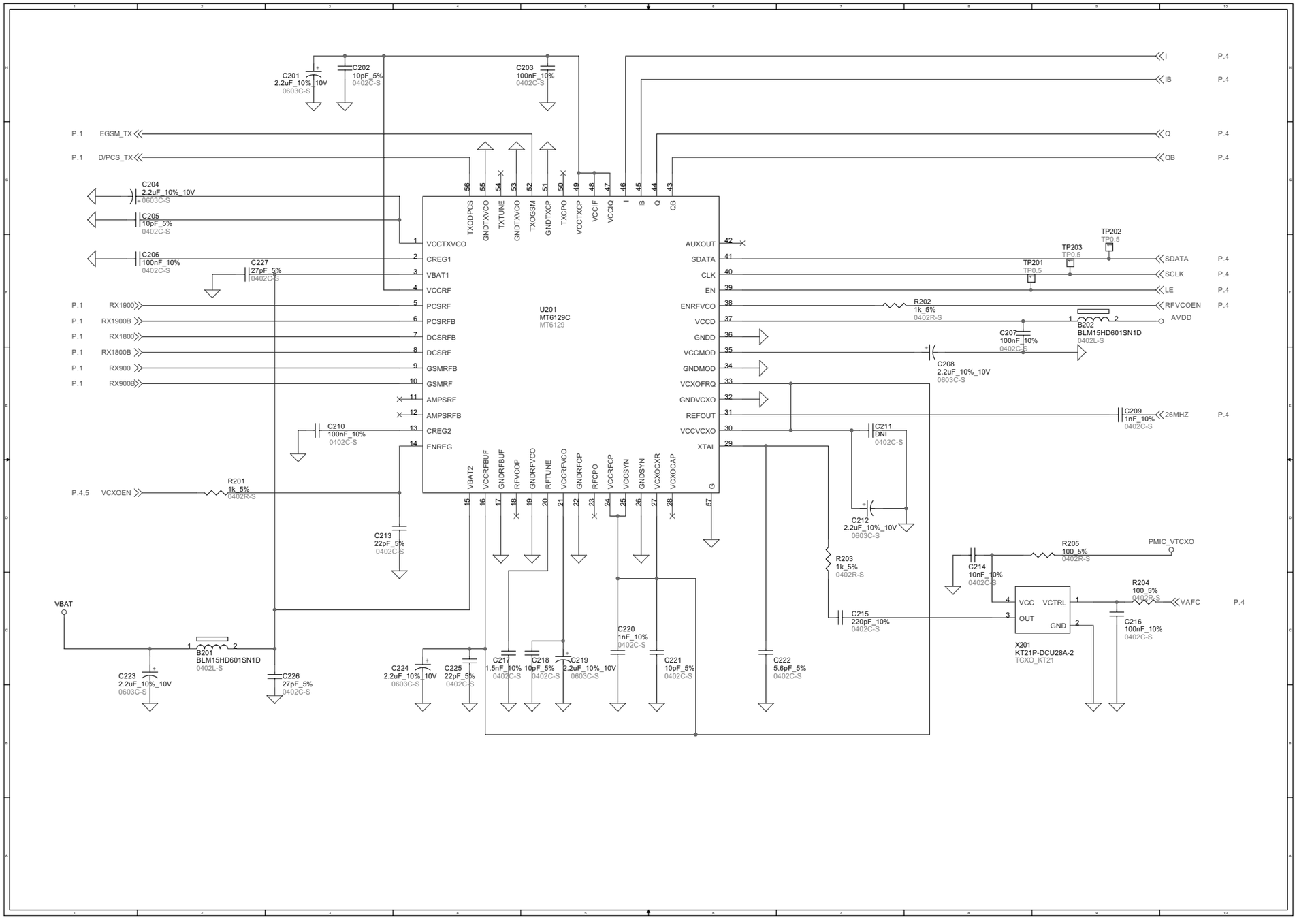


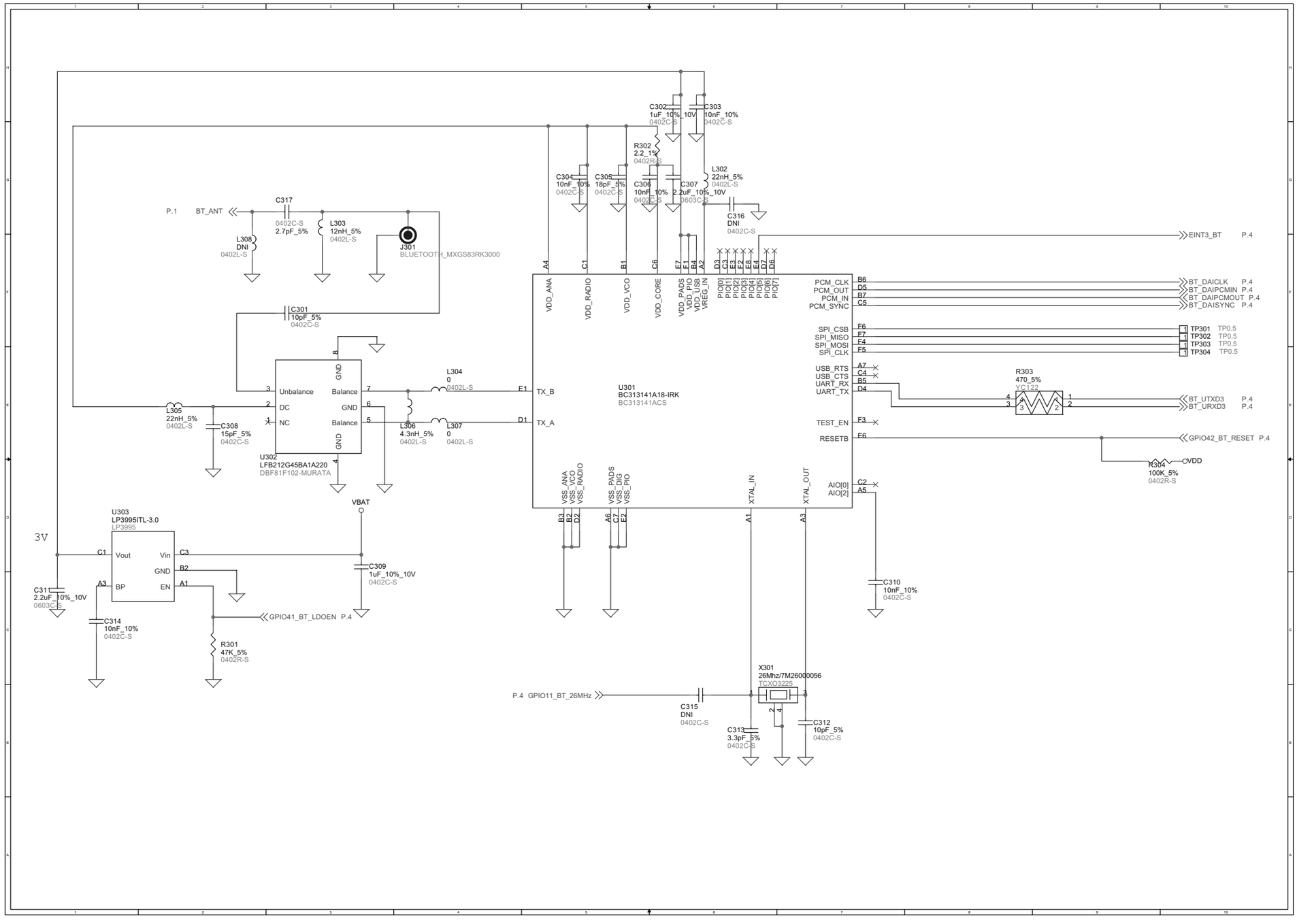
→ After reach to 100%, SW downloads finish.

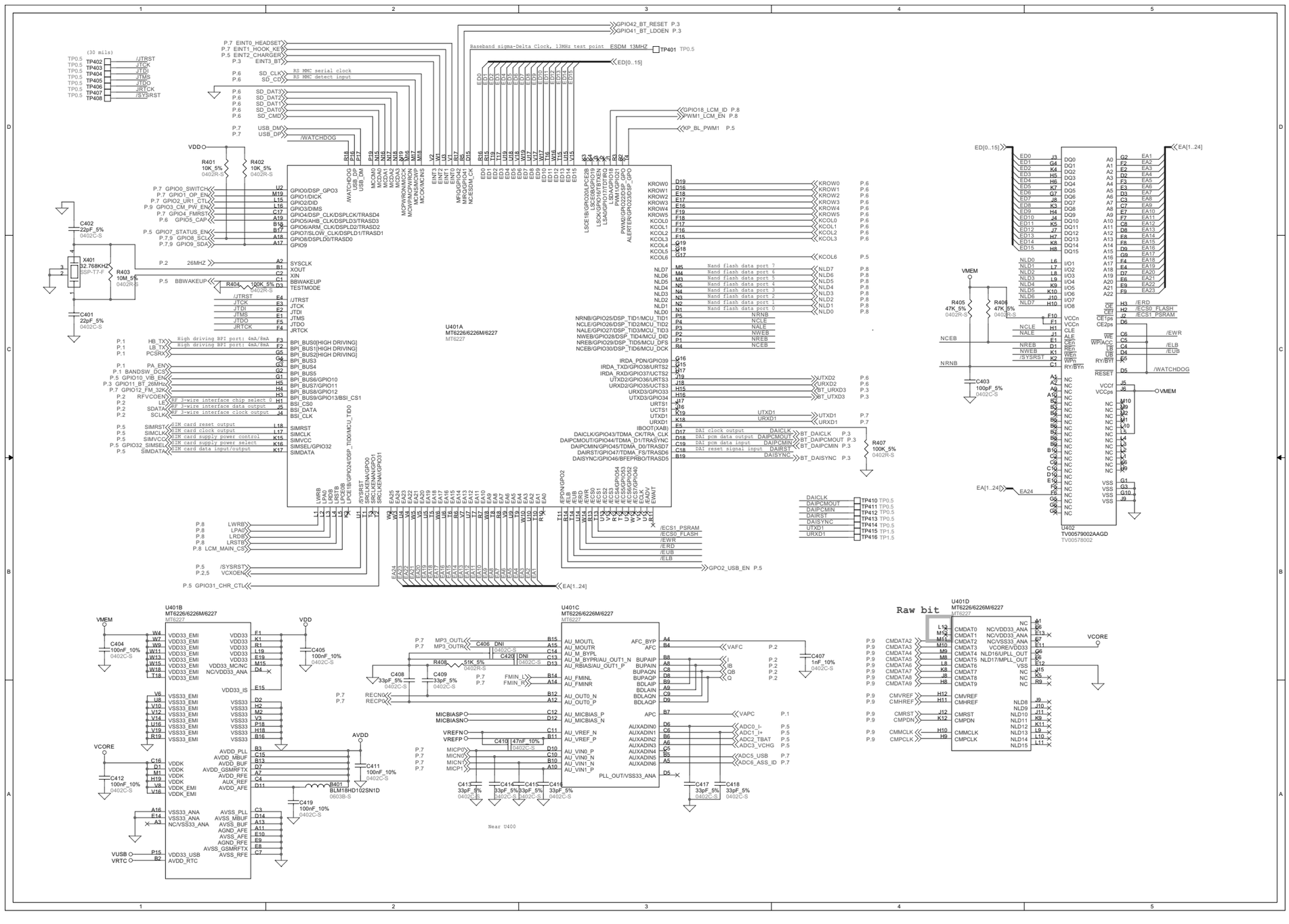
No.	Description	Q'ty	LG P/N	Arima P/N	No.	Description	Q'ty	LG P/N	Arima P/N	No.	Description	Q'ty	LG P/N	Arima P/N
1	KEYPAD PROTECTIVE	1		415-73320-0016	19	PCB MYLAR	1	MTAJ001601	415-73320-0019	37	CAMERA LENS	1	MWAE0027901	403-73320-0002
2	MAIN LENS	1	MWAC0083001	403-73320-0001	20	CAMERA	1	SVCY0015501	335-0000-00013	38	CAMERA RING TAPE	1	MTAA0142401	415-73320-0007
3	MAIN LENS TAPE	1	MTAD0071901	415-73320-0006	21	CAMERA SIDE SPONGE	1		415-73320-0043	39	CAMERA RING	1	MDAD0032701	415-73320-0009
4	FRONT COVER	1	MCJK0075001	401-73320-0001	22	SPEAKER	1	SUSY0027001	313-0000-00044	40	RF HOLDER	1	MCIA0019201	405-73320-0001
5	LED LENS	1	MLCE0008201		23	VIBRATOR	1	SJMY0009101	320-0000-00013	41	ANTENNA	1	MCIB0000601	330-0000-00028
6	RECEIVER	1	SURY0013601	313-0000-00051	24	CAMERA SPONGE	1	MPBT0044601	415-73320-0002	42	SCREW	4	GMEY0018601	409-00000-0007
7	KEYPAD RUBBER TAPE	1	MTAG0005001	415-73320-0013	25	CAMERA SWITCH MYLAR	3		415-73320-0022	43	BATTERY	1	SBPL0089701	306-0000-00028
8	KEYPAD RUBBER	1	MBJA0025501	404-73320-0003	26	SIDE KEY	1	MBJL0044801	404-73320-0001	44	SPK MESH SPONGE	1	MFBD0024901	415-73320-0012
9	LCM SPONGE	1	MPBG0064601	415-73320-0001	27	FRAME	1	MCJN0071201	402-73320-0001	45	BATTERY COVER	1	MCJA0048401	405-73320-0003
10	METAL DOME	1	ADCA0069201	415-73320-0010	28	LATCH	1			46	CAMERA LENS PROTECTIVE	1		415-73320-0015
11	KEYPAD PCB	1	SAJY0026901	8PCB-7332-0-01	29	RF CAP	1		415-73320-0024	47	CAMERA MODULE SPONGE	1		415-73320-0023
12	KEYPAD PCB TAPE	1	MTAC0054101	415-73320-0008	30	MIC	1	SUMY0011901	312-0000-00008					
13	SHIELDING COVER	1	MCBA0022501	415-73320-0014	31	MIC MESH	1	MFBD0025001	415-73320-0018					
14	RF SHEIDING CASE	1	MCBA0022701	415-73320-0002	32	WATER SENSITIVE LABEL	1	MLAB0003901	4780222800000GJ					
15	KEYPAD PCB PORON	1		415-73320-0017	33	SD COVER	1	MCCG0009101	405-73320-0005					
16	LCM	1	SVLM0026801	327-0000-00022	34	CAMERA KEY	1	MBJC0022901	404-73320-0002					
17	LCM CONDUCTIVE SPONGE	2	MGAD0147301	415-73320-0003	35	USB COVER	1	MCCE0039301	405-73320-0004					
18	PCBA	1	SAFF0146001	8PCB-7332-3-01	36	CAMERA LENS SPONGE	1	MTAK0002401	415-73320-0021					

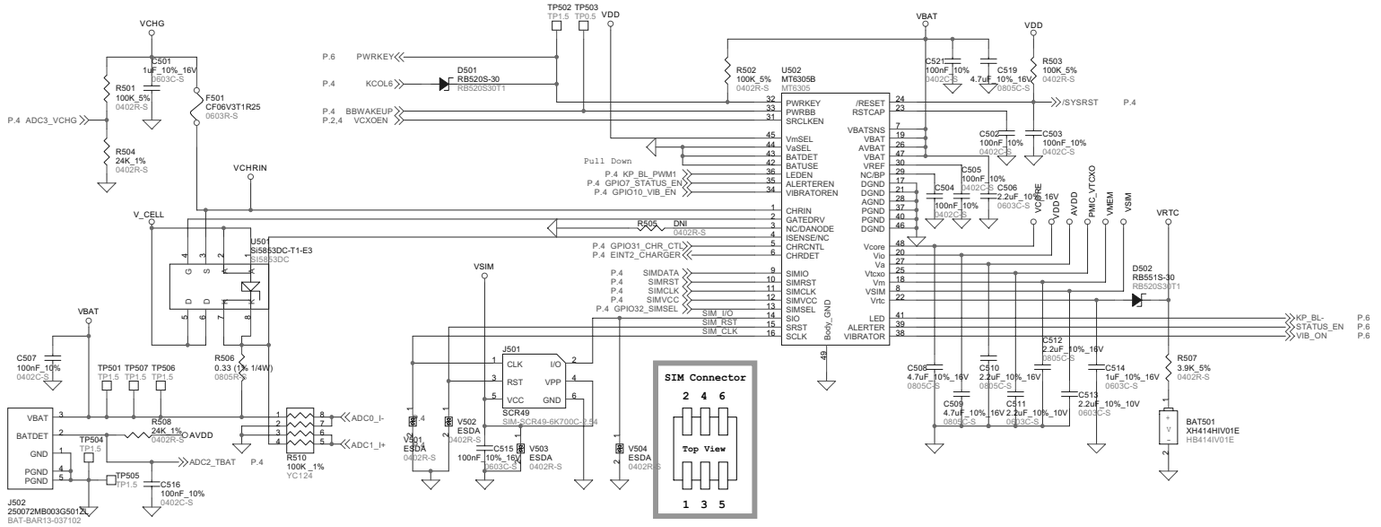




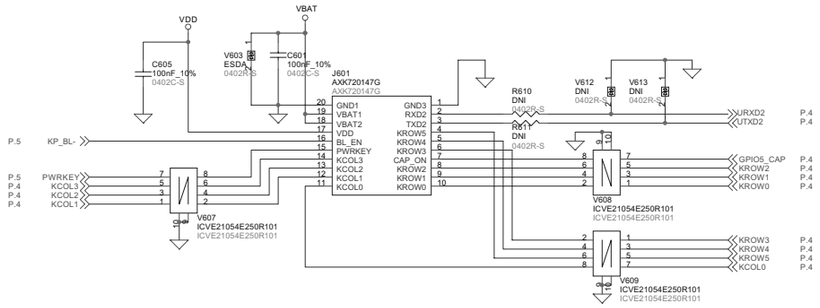


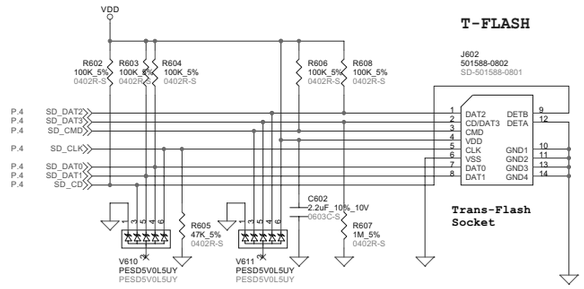


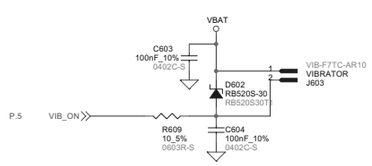


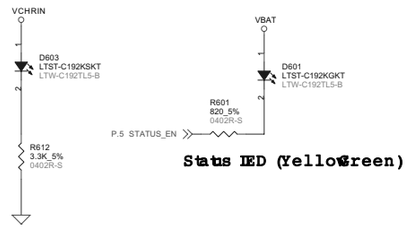


USB POWER

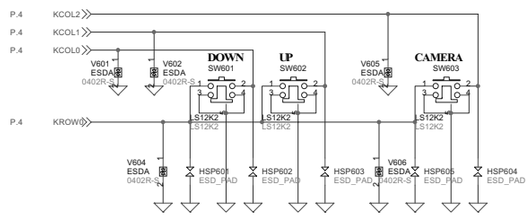




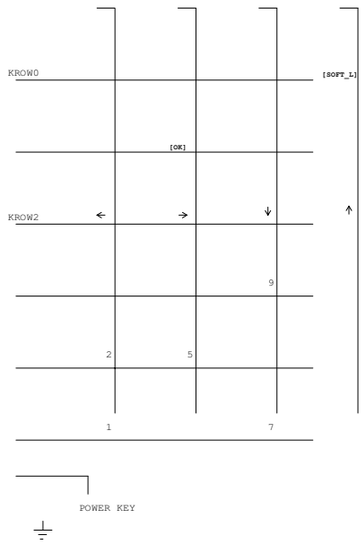


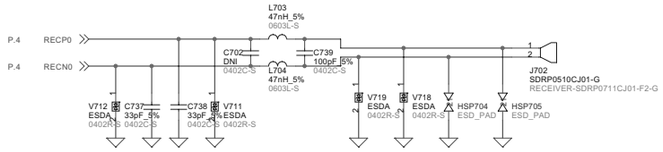


Status LED (Yellow/Green)

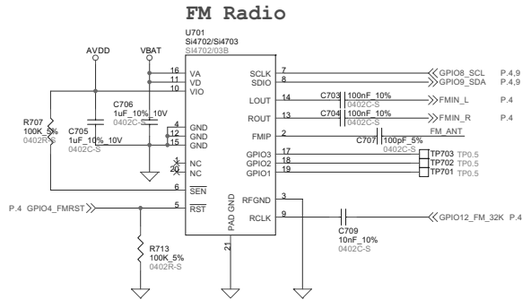


KEY PAD





FM Radio

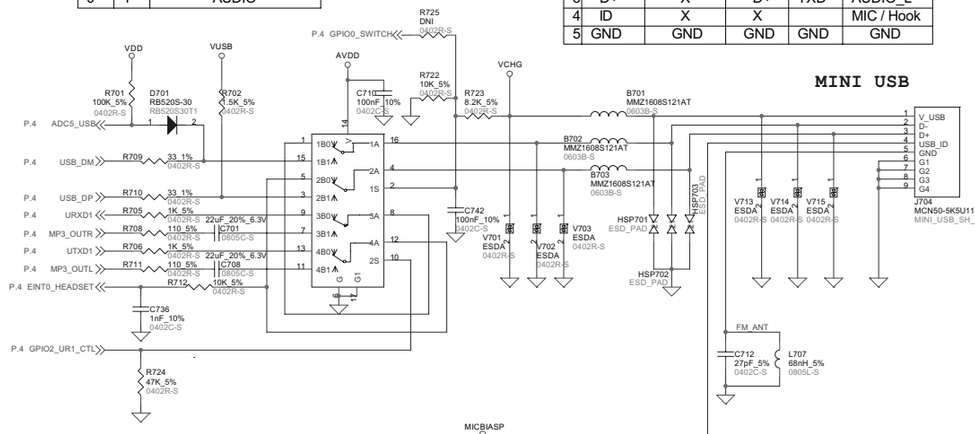


FSA2467 Function Select		
1S	2S	Function Mode
1	X	USB
0	0	UART
0	1	AUDIO

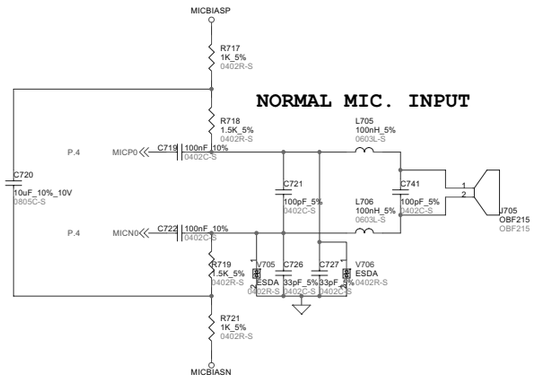
Accessory PIN Define

		Charger	USB	UART	Hands-free
1	V_USB	Charger_in	V_USB	X	X
2	D-	X	D-	RXD	AUDIO_R
3	D+	X	D+	TXD	AUDIO_L
4	ID	X	X		MIC / Hook
5	GND	GND	GND	GND	GND

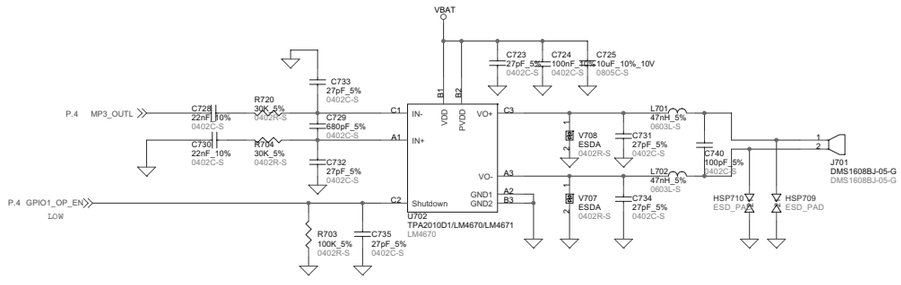
MINI USB

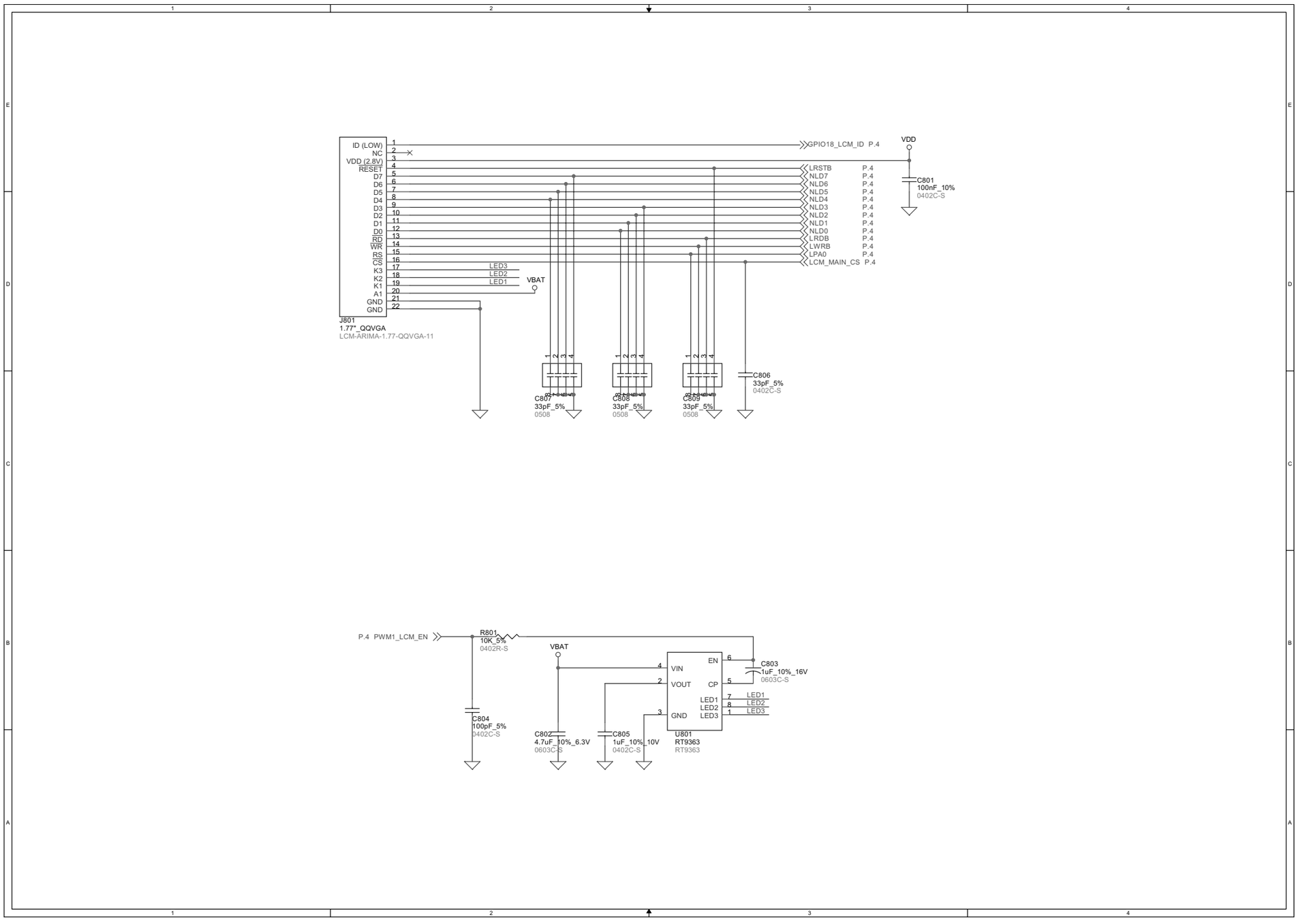


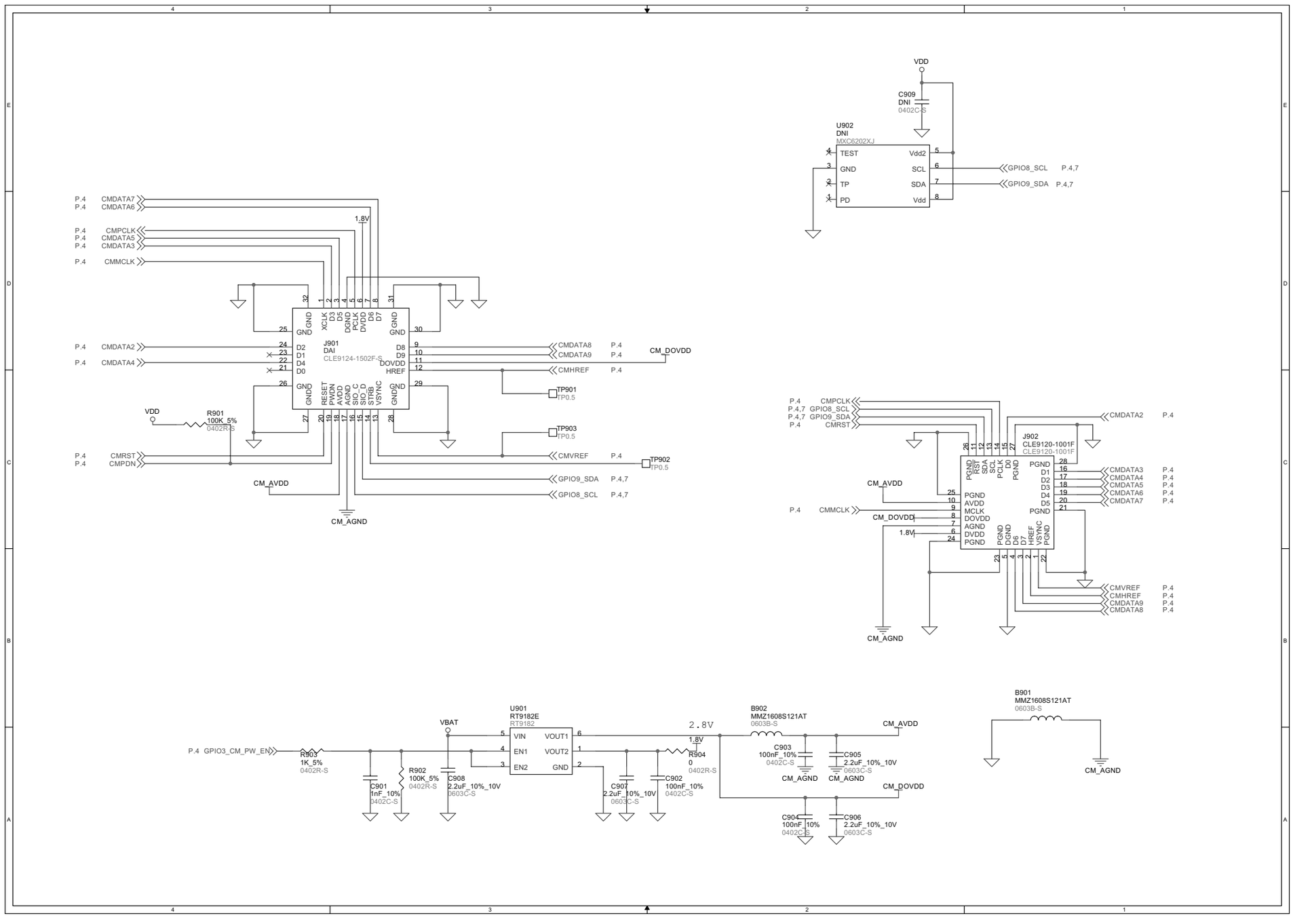
NORMAL MIC. INPUT

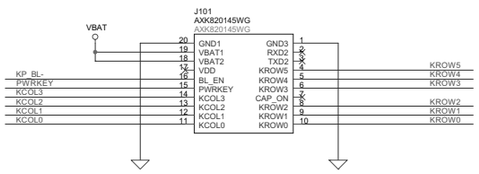


SPEAKER AMPLIFIER

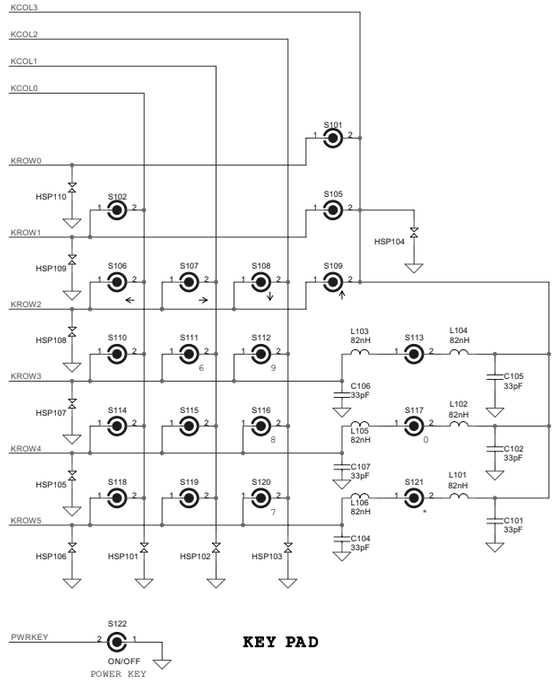








LED



KEY PAD

KG195 Spare parts List V1.0

Level	Location NO.	Description	LG Part Number	Arima Part Number	Specification	Color	Remark
2		PHONE	APEY0434501	ñ	KG195_Black_IND(India)	Black	English Key
3		PCB ASSY,MAIN	SAFY0025401	-	PCB Ass'y Main	-	
4		PCB ASSY, MAIN, INSERT	SAFB0076201	ñ	PCB Ass'y Main Insert		
5		LCD MODULE	SVLM0026801	327-0000-00022	LCD TFT_Transmissive_128x160 Pixels_1.77 inch_IM177BBNBA-V10_LG INNOTEK_65K color, FPC type	-	
5		Gasket,Shield Form	MGAD0147301	415-73320-0003	GASKET_7332_N/A_CONDUCTIVE GASKET_N/A_LCM CONDUCTIVE GASKET_SIAU CHON_N/A	-	
5		TAPE,SHIELD	MTAC0054101	415-73320-0008	ADHESIVE_7332_NoColor_ADHESIVE_N/A_Keypad PCB Tape_SIAU CHON_CONDUCTIVE GLUE	-	
5		CAMERA	SVCY0015501	335-0000-00013	CAMERA MODULE CMOS_ARV6F311_VGA_ABILITY_ARV6F311	-	
5		TAPE,FLEXIBLE PCB	MTAJ0001601	415-73320-0019	SHEET_7332_BLACK_PET_N/A_MYLAR SHEET FOR PCB_SIAU CHON_N/A	-	
5		PCB ASSY,SUB	SAJY0026901	8PCB-7332-0-01	PCBA Sub-Ass'y_7332_NATURAL_UPPER BOARD FOR LG	-	
6		DOME ASSY,METAL	ADCA0069201	415-73320-0010	DOME_7332_NoColor_STAINLESS STEEL_N/A_7332_METAL_DOME_PRINTEC_□=4.0mm,FORCE=180g	-	
6		PAD,FLEXIBLE PCB	MPBF0023301	415-73320-0017	DAMPER_7332_N/A_PORON_N/A_KEYPAD PCB PORON_SIAU CHON_N/A	-	
4		PCB ASSY,MAIN,SMT	SAFF0146001	8-01-7332N0-01	MainBoard PCBA	-	
5	X201	X-TAL	EXXY0024901	305-0000-00003	TCXO_KT21P-DCU28A-26.000M-T_26.0 MHZ_± 2.5 ppm_SMD-3.2*2.5mm_AVX KYOCERA_N/A	-	
5	X301	X-TAL	EXXY0024701	305-0000-00019	Crystal Oscillator_7M26000056_26.0 MHZ_± 10.0 ppm_SMD-3.2*2.5mm-4Pin_TXC_N/A	-	
5	X401	X-TAL	EXXY0024801	305-0000-00021	Crystal Oscillator_SSP-T7-F_32.768 KHZ_± 20.0 ppm_SMD-7*1.5mm-4Pin_SII_N/A	-	
5	BAT501	BATTERY PACK, LI-ION	SBPL0092601	306-0000-00013	Li. Button Battery Cell-RTC- Reflowable_3.3V_0.015mAh_NoColor_XH414H IV01E_SII_N/A		
5	F501	FUSE, TIME DELAY	EFFD0002801	308-0000-00016	SMD THIN FILM FUSE_1.250 (1 °) A / 32 V_CF06V3T1R25_0603_TA-I TECHNOLOGY_N/A	-	
5	U102	FILTER, SEPERATOR	SFAY0011201	311-0000-00051	I.C POWER AMP MODULE(RF)_SKY77318_MCM_20 Pins_NoMemory_SKYWORKS_N/A	-	
5	U201	IC	EUSY0325201	311-0000-00152	I.C TRANSCEIVER_MT6129N/AR-L_QFN_56 PIN_NoMemory_MTK_For GSM900/DCS1800/PCS1900	-	
5	U301	IC	EUSY0325901	311-0000-00154	I.C BLUETOOTH MODULE_BC313141A18-IXF-E4_CSP_42 Ball_NoMemory_CSR_For UART only	-	
5	U303	IC	EUSY0348801	311-0000-00150	I.C LDO_LP3995ITLX-3.0_u'SMD_5 Bump balls_NoMemory_NS_3.0V/150mA	-	
5	U401	IC	EUSY0326801	311-0000-00001	IC BASEBAND PROCESSOR_MT6226BA/BC-L_TFBGA_296_BALL_NoMemory_MTK_N/A	-	
5	U402	IC	EUSY0326901	311-0000-00015	I.C STACKED MEMORY_TV00579002EAGD_PFBGA_107_128M+32M+512M_TOSHIBA_NOR FLASH+PSRAM+NAND EEPROM	-	

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Level	Location NO.	Description	LG Part Number	Arima Part Number	Specification	Color	Remark
5	U501	IC	EUSY0347901	310-0000-00024	P Channel-MOSFET+Schottky_Si5853DC-T1-E3_L-1.90*W-3.05_VISHAY_N/A	-	
5	U502	IC	EUSY0325101	311-0000-00153	I.C POWER MANAGEMENT UNIT(PMU)_MT6305BN/CY-D-L_QFN_48 PIN_NoMemory_MTK_N/A	-	
5	U503	IC	EUSY0348101	311-0000-00141	I.C LDO_LP2985ITPX-3.3_u'SMD_5 Bump Package_NoMemory_NS_3.30V/150mA	-	
5	U701	IC	EUSY0348401	311-0000-00019	I.C FM MODULE_Si4703-B16-GM_QFN _20_N/A_SILICON LABS_N/A	-	
5	U702	IC	EUSY0348501	311-0000-00155	I.C AUDIO POWER AMPLIFIER_LM4671ITLXNOPB_u'SMD_9 Ball_NoMemory_NS_LM4671ITLXNOPB	-	
5	U705	IC	EUSY0348001	311-0000-00170	I.C ANALOG SWITCH_FSA2467MPX_MLP_16 PIN_NoMemory_FAIRCHILD_Dual DPDT SW	-	
5	U801	IC	EUSY0348301	311-0000-00142	I.C DC-DC CONVERT_RT9363PJ8_TSOT-23_8 PIN_NoMemory_RICHTEK_N/A	-	
5	U901	IC	EUSY0348201	311-0000-00156	I.C LDO_RT9182EPES_SOT23-6_6 PIN_NoMemory_RICHTEK_Dual O/P1=2.8V,O/P2=1.8V,200mA	-	
5	J101	CONN, TERMINAL, BLOCK	ENTB0004501	314-0000-00032	CON. PIN STICK (POGO) CONTACT_CAM-5117-2935H_3.000 mm_3 pin_YOKOWO_For antenna connector-H=6.8mm	-	
5	J102	CONN, SOCKET	ENSY0020601	314-0000-00070	CON. RF CONNECTOR WITH SWITCH_MM8430-2610RA1_3.000 mm_6 pin_MURATA_N/A	-	
5	J501	CONN, SOCKET	ENSY0020401	314-0000-00074	CON. SIM CARD CONNECTOR_SCR49-6K7009_2.540 mm_6 pin_ACON_H=2.45 mm	-	
5	J502	CONNECTOR, ETC	ENZY0020501	314-0000-00073	CON. BATTERY CONNECTOR_BAR13-037102_2.500 mm_3 pin_ACRON_N/A	-	
5	J601	CONNECTOR, BOARD TO BOARD	ENBY0019501	314-0000-00066	CON. PCB MALE CONNECTOR_AXK720147G_0.400 mm_20 pin_MATSUSHITA_H=1.50mm	-	
5	J602	CONN, RF SWITCH	ENWY0005701	314-0000-00019	CON. MICRO SD CONNECTOR_501588-0802_1.100 mm_8 pin_MOLEX_N/A	-	
5	J902	CONN, SOCKET	ENSY0020501	314-0000-00057	CON. CAMERA MODULE SOCKET CONNECTOR_CLE9120-1005FSZ_0.650 mm_20 pin_SMK_N/A	-	
5	SW601, SW602, SW603	SWITCH, TACT	ESCY0005101	315-0000-00009	Switch Tact_LS12K2-T_12V/20 mA_4 Pin_TACT_CITIZEN ELECTRONIC_Side Tact	-	
5	FL101	FILTER, SAW	SFSY0035201	326-0000-00042	Filter SAW_FAR-F5EB-942M50-B28C_942.5MHz_FUJITSU_For EGSM-50/150 Ohm-SMD 5pin	-	
5	FL102	FILTER, SAW	SFSY0035301	326-0000-00041	Filter SAW_FAR-F6EB-1G8425-B2BG_1842.5MHz_FUJITSU_For DCS-50/150 Ohm-SMD 5 pin	-	
5	FL103	FILTER, SAW	SFSY0035401	326-0000-00043	Filter SAW_FAR-F6EB-1G9600-B2BE_1960.0MHz_FUJITSU_For PCS-Rx-1.7dB-50/150 Ohm	-	
5	U101	FILTER, SEPERATOR	SFAY0009901	329-0000-00005	Triple Switchplexer_ESHS-C085TK_HITACHI_For antenna switch- SMD 14 pin	-	
5	J704	CONN, SOCKET	ENSY0019501	314-0000-00076	CON. MINI USB CONNECTOR_MNC40-5K5U13_0.800 mm_5 pin_ACON_H=3.95 mm	-	
5		CAN, SHIELD	MCBA0022501	415-73320-0014	CASE_7332_SILVER_COPPER-NICKEL-ZINC ALLOY_N/A_BASEBAND SHIELD CASE_JINCHYA_T= 0.15mm	-	
5		CAN, SHIELD	MCBA0022701	405-73320-0002	Cover_7332_NoColor_COPPER-NICKEL-ZINC ALLOY_N/A_RF SHIELD CASE_JINCHYA_N/A	-	

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Level	Location NO.	Description	LG Part Number	Arima Part Number	Specification	Color	Remark
5		FILTER, DIELECTRIC	SFDY0002401	326-0000-00039	Filter Dual Mode_EXC24CP121U_100MHz_PANASONIC_Noise,4pin-0504,120Ohm,I=500mA	-	
5		FILTER, DIELECTRIC	SFDY0002301	326-0000-00038	Filter Bandpass_LFB212G45BA1A220_2450MHz_MURATA_BW=50MHZ,50 & 34.2-j95 Ohm	-	
5		CONNECTOR, BOARD TO BOARD	ENBY0020101	314-0000-00067	CON. PCB MALE CONNECTOR_AXK820145WG_0.400 mm_20 pin_PANASONIC_H=1.5mm	-	
5		VARISTER	SEVY0008601	3080040000006A	GP_VARISTOR_5V_VPORT0402100MV05_0402_10pF_INPAQ	-	
3		COVER ASSY,FRONT	ACGK0093201 ACGK0093205 ACGK0093206 ACGK0093207 ACGK0093208 ACGK0097101	8M01-7332-B001	Front Cover Sub-Ass'y_7332_BLACK_FOR LG	Black	ACGK0093201 - BK / English ACGK0093205 - BK / Russia ACGK0093206 - BK / Arabic ACGK0093207 - BK / Traditional Chinese ACGK0093208 - BK / Thai ACGK0097101 - BK / Symplified Chinese
4		COVER,FRONT	MCJK0075001 MCJK0075005 MCJK0075006 MCJK0075007 MCJK0075008 MCJK0075009	401-73320-0001	Front Cabinet_7332_BLACK_PC_Painting_Front Cover_BROADNEW_N/A	Black	MCJK0075001 - BK / English MCJK0075005 - BK / Russia MCJK0075006 - BK / Arabic MCJK0075007 - BK / Traditional Chinese MCJK0075008 - BK / Symplified Chinese MCJK0075009 - BK / Thai
4		PAD,LCD	MPBG0064601	415-73320-0001	DAMPER_7332_N/A_PORON_N/A_LCM SPONGE_SIAU CHON_N/A	-	
4		TAPE,WINDOW	MTAD0071901	415-73320-0006	ADHESIVE_7332_NoColor_ADHESIVE_N/A_Main lens tape_SIAU CHON_N/A	-	
4		WINDOW,LCD	MWAC0083001	403-73320-0001	Lens_7332_BLACK_PMMA_Painting_Main lens_ST_For LG	Black	
4		BUTTON,DIAL	MBJA0025501	404-73320-0003	Key_7332_N/A_RUBBER SILICON RUBBER_Painting_ENGLISH_MAIN kEYPAD_N/A_N/A	Black	
4		TAPE,BUTTON	MTAG0005001	415-73320-0013	ADHESIVE_7332_NoColor_ADHESIVE_N/A_Keypad Rubber Tape_SIAU CHON_N/A	-	
4		RECEIVER	SURY0013601	313-0000-00051	RECEIVER_SDRP0711CJ01-F6-G_10.9 * 7.5 mm_32 Ohm_101dB_AAC_±3 dB, Spring contact type	-	
3		COVER ASSY,REAR	ACGM0094301 ACGM0097701	8M02-7332-E001	Rear Cover Sub- Ass'y_7332_GRAY_FOR LG	Gray(for BK) / FB	ACGM0094301 - Gray(for BK) ACGM0097701 - FB
4		COVER,REAR	MCJN0071201 MCJN0073601	402-73320-0001	Rear Cabinet_7332_GRAY_PC_Painting_Rear Cover_BROADNEW_N/A	Gray(for BK)/ FB	MCJN0071201 - Gray(for BK) MCJN0073601 - FB
4		PAD,CAMERA	MPBT0044601	415-73320-0002	DAMPER_7332_N/A_PORON_N/A_CAMERA SPONGE_SIAU CHON_N/A	-	
4		WINDOW,CAMERA	MWAE0027901	403-73320-0002	Lens_7332_BLACK_PMMA_Painting_Camera lens_ST_N/A	-	
4		TAPE,CAMERA	MTAK0002401	415-73320-0011	ADHESIVE_7332_NoColor_ADHESIVE_N/A_Camera lens Tape_SIAU CHON_N/A	-	
4		DECO,CAMERA	MDAD0032701	415-73320-0009	DECORATION_7332_SILVER_ALUMINUM_N/A_Camera Ring_JINCHYA_N/A	-	
4		TAPE,DECO	MTAA0142401	415-73320-0007	ADHESIVE_7332_NoColor_ADHESIVE_N/A_Camera Ring Tape_SIAU CHON_N/A	-	

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Level	Location NO.	Description	LG Part Number	Arima Part Number	Specification	Color	Remark
4		FILTER,MIKE	MFBD0025001	415-73320-0018	FILTER_7332_N/A_FELT MESH_N/A_MIC MESH_SIAU CHON_FOR LG	-	
4		BUTTON,FUNCTION	MBJC0022901 MBJC0023401	404-73320-0002	Key_7332_GRAY_RUBBER SILICON RUBBER_Painting_N/A_CAMERA kEY_ALL BLESSING_N/A	Gray(for BK) / FB	MBJC0022901 - Gray(for BK) MBJC0023401 - FB
4		BUTTON,SIDE	MBJL0044801 MBJL0046601	404-73320-0001	Key_7332_GRAY_RUBBER SILICON RUBBER_Painting_N/A_SIDEKEY_ALL BLESSING_N/A	Gray(for BK) / FB	MBJL0044801 - Gray(for BK) MBJL0046601 - FB
4		CAP,RECEPTACLE	MCCE0039301 MCCE0040601	405-73320-0004	Cover_7332_N/A_PC+ABS+TPU_Painting_USB COVER_ALL BLESSING_For LG	Gray(for BK) / FB	MCCE0039301 - Gray(for BK) MCCE0040601 - FB
4		CAP,MULTIMEDIA CARD	MCCG0009101 MCCG0009501	405-73320-0005	Cover_7332_N/A_PC+ABS+TPU_Painting_SD COVER_ALL BLESSING_For LG	Gray(for BK) / FB	MCCG0009101 - Gray(for BK) MCCG0009501 - FB
4		Cap,Mobile Switch	MCCF0046401	415-73320-0024	SLEEVE_7332_N/A_RUBBER∑SILICON RUBBER_N/A_RF RUBBER CAP_ALL BLESSING_FOR LG	-	
4		LABEL,A/S	MLAB0003901	478022280000GJ	GP_WATER SENSITIVE LABEL_2228_GLOBAL_BAR CODE TYPE_MING JYE	-	
4		VIBRATOR	SJMY0009101	320-0000-00013	Vibrator Bar Type_F7TC-AR10_R1.8+4.10*4.35*15.10mm_SHICOH_Spring contact	-	
4		SPEAKER	SUSY0027001	313-0000-00044	LOUD SPEAKER_EMS1635A_ 16.0 mm_8 Ohm_90.0dB_EM-TECH_H=4.2mm, Spring Contact type	-	
4		CONTACT ASSY,ANTENNA	ACFY0005601	8M07-7332-N001	Antenna Cover Sub-Ass'y_7332_NATURAL_FOR LG	-	
5		CONTACT,ANTENNA	MCIA0019201	405-73320-0001	Cover_7332_NATURAL_PC+ABS_N/A_RF Cover_BROADNEW_N/A	-	
5		CONTACT, HINGE	MCIB0000601	330-0000-00028	ANTENNA EMBEDDED_7332_QUAD BAND(GSM/DCS/PCS/BLUETOOTH)_GOLD_SNG-DES-104-H00456_PERLOS/Moteco_N/A	-	
4		MIC	SUMY0011901	312-0000-00008	Omni-MIC._OBF213-42S1033 (+/- 2)_60 'dB_- 42dB_± 2.0dB_ 4.0*1.30mm_Holder_Spring Contact_CST_N/A	-	
3		SCREW MACHINE, BIND	GMEY0018601	409-00000-0007	Machine Screw_Round Head_Cross Type(JCIS)_1.6mm_4.5 mm_BLACK_Steel_Plating Chromium_HNS_Red Nylok	-	
3		LABEL,APPROVAL	MLAA0047501 MLAA0047601 MLAA0047701 MLAA0049901 MLAA0050101	478-733200-003	HANDSET LABEL_Packing Label_7332_Global_SILVER MATTE POLYESTER Paper_N/A_CYMMETRIK	-	IMEI Label MLAA0047501 - MADE BY LGE MLAA0047601 - MADE BY LGE(UCRF) MLAA0047701 - MADE IN TAIWAN MLAA0049901 - MADE IN CHINA MLAA0050101 - MADE BY LG
3		COVER ASSY,BATTERY	ACGA0019801	8M03-7332-B001	Battery Cover Sub-Ass'y_7332_BLACK_FOR LG	Black	
4		Cover,Battery MCJA0048401		405-73320-0003	Cover_7332_BLACK_PC_Painting_Battery Cover_BROADNEW_N/A	Black	
4		FILTER,MIKE	MFBD0024901	415-73320-0012	FILTER_7332_BLACK_NYLON_N/A_Speaker Mesh_SIAU CHON_N/A	Black	
4		BATTERY PACK, LI-ION	SBPL0089702 SBPL0089703 SBPL0089701	306-0000-00028	Lithium-Polymer Batt. Packing_3.7V_750mAh_BLACK_LP463443ARU-702_BYD_Bar code:SBPL0089702	-	SBPL0089702 - EU SBPL0089703 - LA SBPL0089701 - CN
3		DATA CABLE	SGDY0013501	410-7110000003	Data Cable_7110_FOXCONN_USB/Mini USB, L=300 mm	-	

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Level	Location NO.	Description	LG Part Number	Arima Part Number	Specification	Color	Remark
3		HEADSET	SGEY0007401	330-0000-00026	Headset Stereo Channel Type_OBO-PT-HG12D-04_32 Ohm_Mic.S/N'50 'dB_- 40 'dB_OBO_Mini USB Conn.	-	
3		CHARGER	SGCT0004601 SSAD0023901 SSAD0024001 SSAD0026501	331000000000LY	Travel Charger_100~240V_5.20V_550mA_CE_GP-ACGN-22T-A22_EU50075_GEARWAY_SUNFONE_N/A	-	SGCT0004601 - GR(Sunfone) SSAD0023901 - GT(Sunfone) SSAD0024001 - GU(Sunfone) SSAD0026501 - GC(DongDo E.)
3		RF CABLE	SGDY0012901	410-7312000002	RF Cable	-	Repair Jig
3		SW D/L CABLE	SGDY0013001	410-7332000001	SW D/L Cable	-	
3		DUMMY BATTERY	No partnumber, purchasing		Dummy Battery	-	